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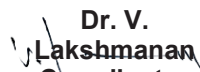
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Author   :   DEEPAK D, MAM SCHOOL OF ENGINEERING

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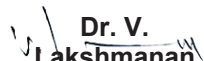ENGINEERING COLLEGE

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Title of the Paper : COMPUTATIONAL INVESTIGATION OF DRAG AND LIFT FORCES ACTING ON AIRCRAFT VEHICLE

Author : DINESH BABU S, MAM SCHOOL OF ENGINEERING

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This is to certify that **Mr.A.SENTHAMARAI KANNAN** of **M.A.M. School of Engineering** has Presented a paper titled "**A dual-transformer DC–DC with Variable frequency modulation Technique**" in the National Level Web Conference on Cutting-Edge Research in Electrical Engineering CEREE conducted by Department of Electrical and Electronics Engineering in association with **SRM TRPEC IEEE STUDENT BRANCH** on **31.03.2021.**

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Optimization of Parameters for Nitronic-60 on Wire-Cut Electrical Discharge Machining using Zinc-Coated Wire

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Optimization of Parameters for Nitronic-60 on Wire-Cut Electrical Discharge Machining using Zinc-Coated Wire

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Abstract. The objectives of this work are to research the effective parameters of pulse ON time; pulse OFF time; voltage & wire feed whereas machined on Nitronic-60 exploitation wire-cut discharge machining exploitation zinc-coated wire. During this work, metal removal rate, surface roughness, and kerfwidth are taken as output parameters. The experimental results planned an optimum combination of parameters that provide the utmost material removal rate, minimum surface roughness, and kerf dimension. Finally, confirmation experiments were disbursed to spot the effectiveness of the planned technique. Multivariate analysis and ANOVA are performed exploitation Response Surface Linear Model.

1. Introduction

Machining eliminates certain components of work piece items to alter them to finished components. Machining are classified into ancient machining and Non-traditional machining. Ancient Machining, conjointly referred to as typical machining needs the tougher tool than the work piece. This tool ought to be pierced within the workpiece to a definite depth. Besides, a motion between tool and workpiece is to blame for creating or producing the desired form. The nonappearance of any of those parts in machining method like the absence of tool and workpiece contact or relative motion makes the method a non-traditional one.

2. Literature survey

Vinod Kumar et al (2015) have planned a mathematical model and experimented by taking six WEDM method parameters. They have used D2 alloy steel employing Zn coated Copper wire conductor. Output such as MRR, Surface Roughness, and Kerf were used for further analysis. Soundrarajan et al (2015) have mentioned and investigated the analysis of various parameters using RSM. ANOVA is employed to search out the share contribution of serious method parameters. WEDM was used for machining A413 alloy which are making tools.

Pujari Srinivasa et al (2016) experimented the work on Ti6AL4V alloy for analysing the result of voltage, material pressure, and pulse on time and pulse off-time. It is concluded that pulse on-time and pulse off time are important parameters that affect the spark gap of WEDM. Antar et al (2011) studied the various factors that affect the WEDM of Inconel-600 using RSM method. They have used four input method parameters of WEDM to review the method performance. Brajaesh lodhi and Sanjay Agarwal (2014) investigated the results of the responses by varying WEDM method parameters on the machining AISI 304 chrome steel and got the optimized results from the analysis.

Panchal Yogesh Ratilal et al (2018) used L_{18} OA for conduction of experiments for solving single response problem. H-21 die alloy steel was taken as work piece material and Zn coated brass wire was taken as tool material. Herbert et al (2012) have conducted experiments on Nickel based super alloy for the evaluation of surface integrity in hole making process.

A detailed review was given by Chennakeseva Reddy Alavala and Naresh Baki (2016) in the area of application of CNC EDT for Aerospace application. RSM is the powerful tool that can be used for optimization of WEDM process (Gopalakannan et al 2012) and (Balasubramanian and Senthilvelan 2014). Sharanya Nair and Nehal Joshi (2014) reviewed the various works carried out on composite materials using WEDM. Kamal Jangara (2012) conducted the experiments in WEDM for studying unmachined area in intricate machining after roughcut.

Several machining parameters optimization were carried out by the previous researchers on different materials using WEDM and RSM was used for the development of mathematical models. But there is a lacking in WEDM study of Nitronic 60 material which is used for making stack liners, ducts, dampers, scrubbers etc. So in this work experiments were conducted on Nitronic 60 material in WEDM and RSM method is used for developing mathematical model for the important responses such as machining time and surface roughness and kerfwidth.

3. Experimental details

Experiments were conducted on corrosion materials of Nitronic 60 using a wire electrical discharge machine (WEDM). Zinc wires is used as tool.

Table 1 shows the composition of Nitronic 60 and Table 2 shows its properties.

Table 1 Composition of Nitronic 60

MATERIALS	COMPOSITION (%)
Ni	8-9
Cr	16-18
N	0.08-0.18
Mn	7-9 Max.
C	0.1 Max.
Si	3.5-4.5 Max.

Table 2 Properties of Nitronic 60

Density @ 72° F	7700-7700 lb/in. ³
Melting Temperature	1450° F to 1510° F
Specific heat	460-460 Btu/lb. ° F
Electrical Resistivity @ 75° F	0.55-0.55 µΩ.m

Zinc anodes are sensibly protected and can be concentrated also. They yield unexpected voltages in comparison to the copper cells. In a specific, magnesium or copper cells can create voltage as extensive as 1.6v in lemon cells. This voltage is bigger than zinc or copper cells. It is similar to that of standard family unit 1.5v which helps control gadgets. Zinc is a somewhat blue-white, radiant metal. It is weak at normal temperatures yet pliable at 373-545k. It is a reasonable transmitter of power and consumes noticeable all around at high red warmth with an assessment of white billows of oxides. The metal is utilized in various amalgams with different metals. Metal, nickel, silver, business bronze, and aluminium are probably the most significant amalgams. Enormous amounts of zinc are utilized to deliver bite the dust projecting, which are utilized widely via auto, electrical, and equipment businesses. So Zinc terminals are utilized for wire electrical release machining of Nitronic 60. The test results have appeared in Table 3. Reaction Surface Methodology is utilized for additional examination.

4. Result and discussions

The primary objectives of this work is to analyze various input parameters in WEDM for machining Nitronic 60. Ton, Toff, Voltage and Wire feed were taken as input parameters and Machining time, Surface roughness and Kerfwidth were taken as responses. RSM was used for further analysis. Table 4 and Figure 1 shows the regression analysis for machining time.

Table 3 Experimental Results

T on	T off	Voltage	Wire feed	Machining time	Surface roughness	Kerfwidth
4	2	40	2	477.38	2.18	0.247
4	4	45	4	557.07	2.03	0.291
4	6	50	6	671.96	1.8	0.289
4	8	55	8	796.43	1.64	0.294
6	2	50	4	465.75	1.69	0.297
6	4	55	6	562.08	1.85	0.32
6	6	40	8	500.24	2.03	0.289
6	8	45	2	556.47	1.99	0.29
8	2	55	6	463.32	1.86	0.292
8	4	50	8	472.12	1.83	0.293
8	6	45	2	488.27	1.84	0.355
8	8	40	4	208.37	2.17	0.344
10	2	45	8	445.53	2	0.332
10	4	40	6	459.38	2.26	0.357
10	6	55	4	568.47	1.69	0.368
10	8	50	2	559.75	1.79	0.367

Table 4 Regression analysis for machining time

Response	1		Machining tim		
ANOVA					
	Sum of		Mean	F	p-va
Source	Squares	Df	Square	Value	Pr
Model	31430	10			0.0
A-T on	31950	1			0.01
B-T off		1			-
C-		1			0.05
D-		1			
AB		1			
AC		1			
AD		1			
BC		1			
BD		1			
CD		1			
		5			
		15			
			R-		
			-		
			-		

Figure 1 Machining time

From Table 4 and figure 1, the Pred R-Squared" is 0.2164 and Adj R-Squared is 0.8508 "Adeq Precision" measures the signal-to-noise ratio. A ratio greater than 4 is desirable. A ratio of

14.180 indicates satisfactory signal. The model developed for machining time from this study is given below

Machining time = +685.03319+22.19034 * T on-192.37313 * T off-13.26234 * Voltage+196.16216 * Wirefeed-9.66693 * T on * T off+0.76868 * T on * Voltage-8.40988 * T on * Wirefeed+5.90026 * T off * Voltage-4.90879 * T off * Wirefeed-2.58316 *Voltage * Wire feed

From Table 5 and Figure 2, it is observed that Model F-value is 9.30 that implies the model is significant. There is only a 0.15% chance that a "Model F-value" this large could occur due to noise.

The "Pred R-Squared" of 0.5652 is reasonable with the "Adj R-Squared" of 0.6889. A ratio of 8.519 indicates satisfactory signal. The model for surface roughness is shown below

Surface roughness=+3.25645+5.12500E-003 * T on-0.012348 * T off-0.027961 * Voltage+2.63587E-003 * Wire feed

Table 5 Regression analysis for surface roughness

Response	2	Surface roughness				
ANOVA						
	Sum of			Mean	F	p-value
Source	Squares	Df		Square	Value	Prob> F
Model	0.400905109	4		0.100226277	9.304597	0.0015
A-T on	0.00210125	1		0.00210125	0.195071	0.6673
B-T off	0.011689275	1		0.011689275	1.085184	0.3199
C-Voltage	0.3746174	1		0.3746174	34.77794	0.0001
D-Wirefeed	0.000511359	1		0.000511359	0.047472	0.8315
Residual	0.118488641	11		0.010771695		
Cor Total	0.51939375	15				
Std. Dev.	0.103786775		R-Squared	0.771871		
Mean	1.915625		Adj R-Squared	0.688915		
C.V. %	5.417906688		Pred R-Squared	0.565183		
PRESS	0.225841212		Adeq Precision	8.519386		
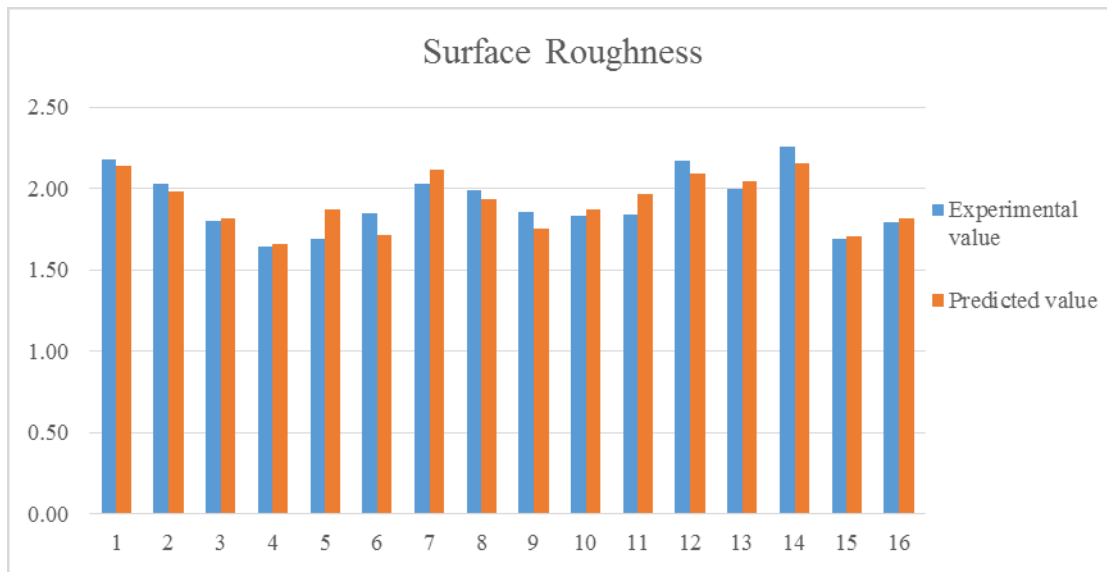
Figure 2 Surface roughness

Table 6 Regression analysis for Kerfwidth

Response	3		Kerfwidth		
ANOVA					
	Sum of		Mean	F	p-value
Source	Squares	Df	Square	Value	Prob> F
Model	0.014964	4	0.003741	10.26591	0.001
A-T on	0.012425	1	0.012425	34.09576	0.0001
B-T off	0.001851	1	0.001851	5.078177	0.0456
C-Voltage	0.000164	1	0.000164	0.449651	0.5163
D-Wirefeed	0.000225	1	0.000225	0.616601	0.4489
Residual	0.004009	11	0.000364		
Cor Total	0.018973	15			
Std. Dev.	0.01909		R-Squared	0.78872	
Mean	0.314063		Adj R-Squared	0.711891	
C.V. %	6.078325		Pred R-Squared	0.586968	
PRESS	0.007836		Adeq Precision	10.31731	
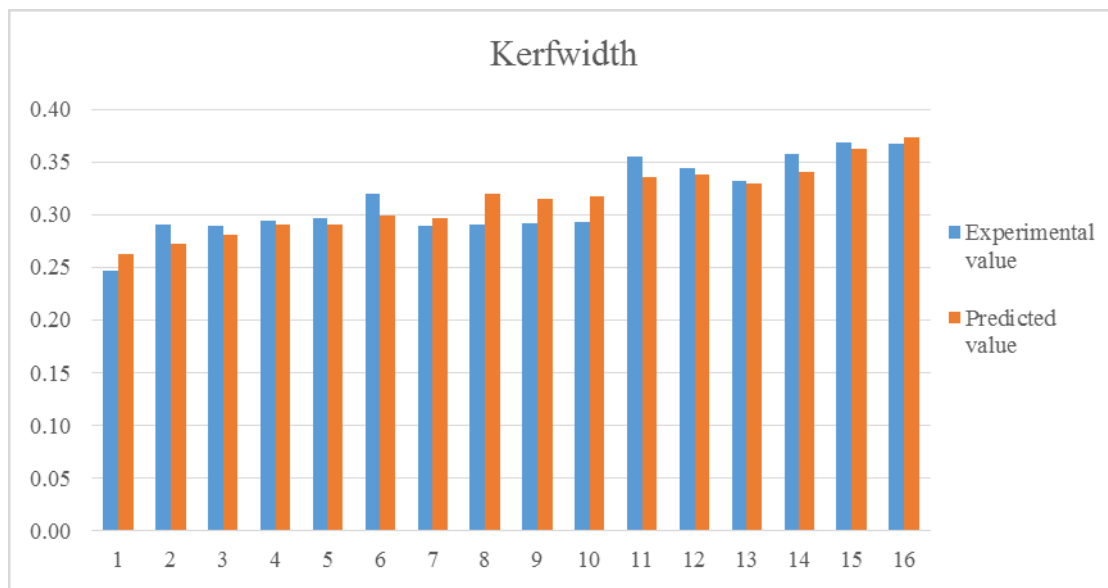
Figure 3 kerfwidth

Table 6 and Figure 3 shows the Regression analysis for Kerfwidth. From Table 6 and Figure 3, it is observed that The Model F-value is 10.27 that implies the model is significant. are many insignificant model terms (not counting those required to support hierarchy), model reduction may improve your model.

The Pred R-Squared" of 0.5870 is in reasonable with the Adj R-Squared" of 0.7119.

A ratio of 10.317 indicates an adequate signal. The developed model for Kerfwidth is shown below.

Kerfwidth=+0.18322+0.012463 * T on+4.91304E-003 * T off+5.84783E-004 * Voltage-1.74728E-003 *Wire feed

5. Conclusion

This experimental work uncovers the accompanying ends on the WEDM procedure on Nitronic 60 workpiece material. The main principle objective was to build up the experimental model utilizing RSM. The reaction surface philosophy is probably the best method to recognize the impacts of machining boundaries on the WEDM cycle. The voltage and heartbeat off time significantly affect machining time. The more elevated level of current produces lower machining time. The reaction surface models were created dependent on the plan of the analysis with current, voltage, and beat on schedule, and heartbeat off time as info, and machining time and surface harshness were the reactions. The reaction surface model has a more modest deviation from test information and affirms that the created model can be utilized to foresee the machining time and surface unpleasantness esteem adequately.

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Characteristic analysis of dissimilar metal weld for AISI304 with SA213T22 in super heater coils

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A R T I C L E   I N F O

A B S T R A C T

Super heater is an inevitable component of any boiler system and failure of super heater leads to break-down of whole plant. The integration of efficient quality welding technologies for dissimilar metals will be a key component in the successful weld quality for power plant components. In this investigation, an attempt has been made to study the dissimilar material AISI304 and SA213T22 tungsten inert gas weld-ing is performed under different welding conditions current (100, 115, 130 Amps), gas flow rate (6, 8, 10 ltr/min), speed (2, 2.5, 3 mm/sec) and micro structure analysis performed to find influence of fusion heat. The Taguchi analysis is implemented to obtain single response optimization and grey relational analysis used to attain multi response for best yield strength, the ultimate strength, Vickers hardness and the elongation of the metals.

1. Introduction

Super heater is basically a heat exchanger in which heat is transferred from furnace gas to the steam. Improper heat transfer between steam and furnace gas leads to problems of localized heating and damage the welding spots. These coils are made up of alloy steel SA213T22 which has corrosion resistance and it can-not withstand continuous high temperature. The super-heater coils are made up of SA213T22 which can withstand up to 540 °C metal temperatures and final stage super-heater stream temperature of more than 565 °C with the increase in steam pressure with their required dissimilar materials. AISI304 has superior properties such as resistance to fire side corrosion and a stream temperature of 650 °C for final super-heater. Hence, the dissimilar materials are introduced to reduce the damage and an interchange material AISI304 is attempted to replace this super-heated coil. The dissim-ilar material welding is not possible to make a fusion weld and welding parameters are affecting the welding quality. The dissim-ilar materials welding have been continuously explored and the related valuable studies presented by the past researchers are given below. Guo Ming et al. [2] studied the dynamic temperature field of laser welding on stainless steel. It was dynamically simu-lated by the FEA software ANSYS using transient heat conduction equation. Kain et al. [3] studied the failure of a few super heater tubes at localized regions in an atmospheric fluidized bed combus-tor. Uger esme and Mehim bayramoglu et al. [4] have used AISI 304 Stainless steel plate. TIG welding machine is used. The input parameters are travel speed, current, nozzle plate distance. The output parameters are bead penetration and tensile load. The opti-mal weld pool geometry has four smaller-the-better quality char-acteristics, i.e. the front height, front width, back height and back width of the weld pool. The modified Taguchi method is adopted to solve the optimal weld pool geometry with four smaller-the-bet-ter quality characteristics. Experimental results have shown that the front height, front width, back height and back width of the weld pool in the TIG welding of stainless steel are greatly improved by using this approach. Ahmad et al. [1] investigated excessive hoop stresses are the cause of failure in on a super alloy Inconel-800 super heater tube. Vibhav gupta et al. [6] found primary reason

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Table 1
Chemical composition of the AISI304 and SA213T22.

AISI304								
C	Cr	Fe	Mn	Ni	P	S	Si	Mo
0.08	19	70	2	10	0.045	0.03	1	–
SA213T22								
0.15	2.60	–	0.60	–	0.025	0.025	0.50	1.13

Table 2
Factors and levels for similar and dissimilar welding.

Factor/ Levels	Level 1	Level 2	Level 3
Current (Amps)	100	115	130
Gas Flow Rate (ltr/min)	6	8	10
Speed (mm/sec)	2	2.5	3

for premature failure of super heater tubes led severe oxidation and creep. Gokula Krishnan et al. [5] presented occurrences of phase transformation and formation of alumnide phase such as Ni3Al. Faith Dokme et al. [7] explained that weld zone micro structural analysis exhibited the existence of multi directional grain growth in all specimens on AISI 316L side. Yu Sun et al. [8] found that Iron alloy is exposed to a high temperature oxidation environment, outer layer of super heater will gradually oxidize into stable
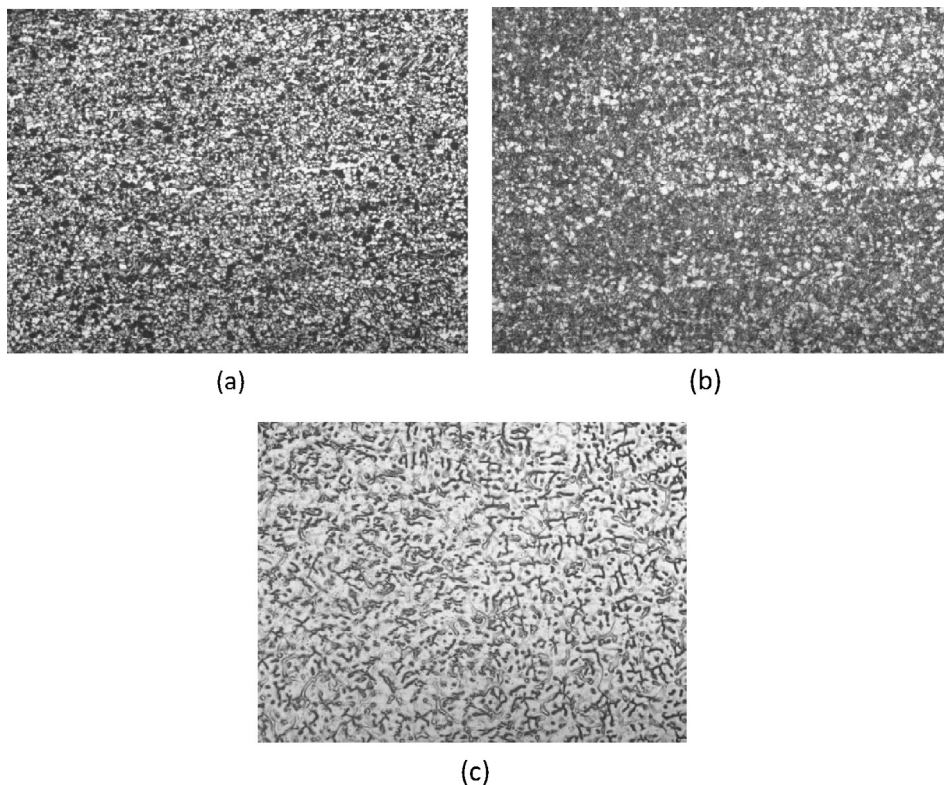
Table 3
Experimental result for AISI304 to SA213T22 dissimilar metal weld.

AISI304 TO AISI304 similar metal weld							
Trials	A	B	C	YS (MPa)	US (MPa)	EL (%)	H (Hv)
1	1	1	1	573.20	625.80	17.50	198.9
2	1	2	2	447.50	635.32	27	197.3
3	1	3	3	365	569.45	14.50	196.3
4	2	1	2	429.90	660.60	20	183.5
5	2	2	3	314	511.62	29.50	177.1
6	2	3	1	370.20	594.65	13.50	185.3
7	3	1	3	433	655.81	30	190.1
8	3	2	1	396.80	571.96	17	206.1
9	3	3	2	400.10	599.47	18	230.1

(a)

(b)

(c)

Fig. 1. Micro graph (Mag: 200x) for fusion (a) Parent material of SA213T22; (b) Dissimilar material HAZ of SA213T22; (c) Dissimilar material weld spot.
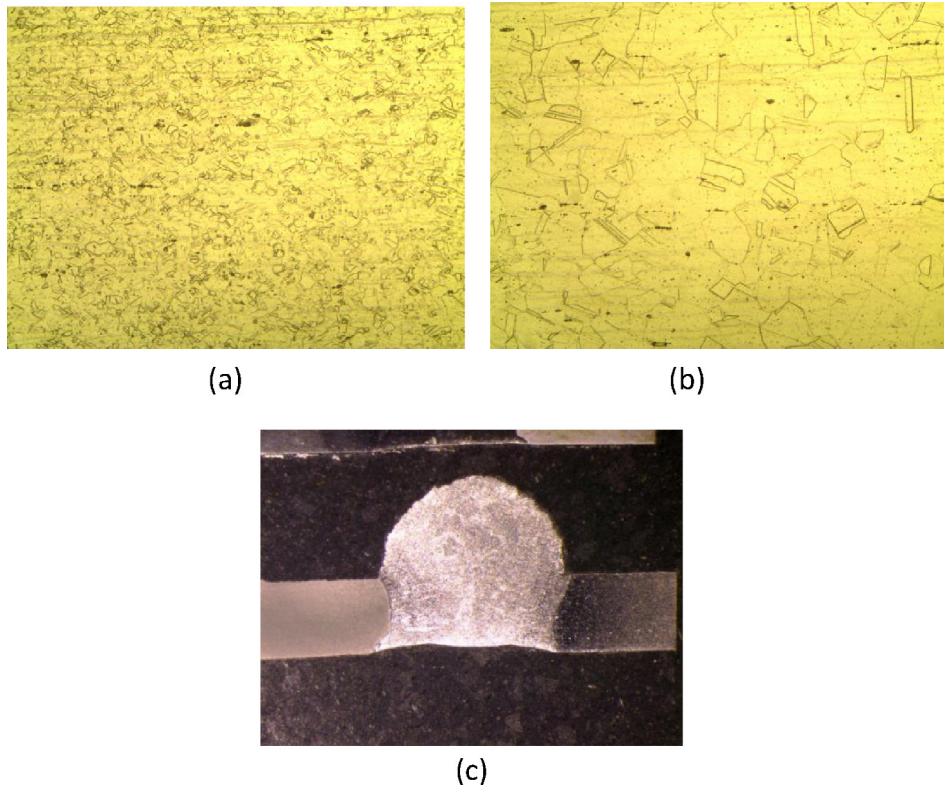
(a)

(b)

(c)

Fig. 2. Micrograph (Mag: 200x) for fusion (a) Parent material of AISI304; (b) Dissimilar material HAZ of AISI304; (c) Macro graph (Mag: 5x) dissimilar material weld spot.

Table 4
Signal to noise ratio for AISI304 to SA213T22 dissimilar metal weld.

AISI304 TO AISI304 similar metal weld							
Trials	A	B	C	YS (MPa)	US (MPa)	EL (%)	H (Hv)
1	1	1	1	55.1661	55.9287	24.8608	45.9727
2	1	2	2	53.0159	56.0599	28.6273	45.9025
3	1	3	3	51.2459	55.1091	23.2274	45.8584
4	2	1	2	52.6673	56.3988	26.0206	45.2727
5	2	2	3	49.9386	54.1790	29.3964	44.9644
6	2	3	1	51.3687	55.4852	22.6067	45.3575
7	3	1	3	52.7298	56.3356	29.5424	45.5796
8	3	2	1	51.9714	55.1473	24.6090	46.2816
9	3	3	2	52.0434	55.5553	25.1055	47.2383

Table 5
Taguchi Analysis: YS & US versus A, B, C.

Level	YS			US		
	A	B	C	A	B	C
1	53.14	53.52	52.84	55.70	56.22	55.52
2	51.32	51.64	52.58	55.35	55.13	56.00
3	52.25	51.55	51.30	55.68	55.38	55.21
Delta	1.82	1.97	1.53	0.34	1.09	0.80
Rank	2	1	3	3	1	2

and dense oxide film. From the study it was observed that flux used as the most significant effect on depth of penetration followed by welding current. Most of the researchers concentrate on the different directions but AISI304 over SA213T22 dissimilar materials weld was not performed yet and hence it is an important to study for the power plant components. Considering all the points into account in this present work. AISI304 to SA213T22 dissimilar

TIG welding process is performed under different welding conditions.

2. Experimental details

The paper aims to investigate and identify key improvements in weld mechanical properties and the microstructural compounds of

Table 6
Taguchi Analysis: YS and US versus A, B, C.

Level	EL			H		
	A	B	C	A	B	C
1	25.57	26.81	24.03	45.91	45.61	45.87
2	26.01	27.54	26.58	45.20	45.72	46.14
3	26.42	23.65	27.39	46.37	46.15	45.47
Delta	0.85	3.90	3.36	1.17	0.54	0.67
Rank	3	1	2	1	3	2

Table 7
Normalized- Grey Relational Coefficient and Grey Relational grade.

Trial No.	Normalized values of Z_{ij}				Grey Relational Co-efficient				Grey Relational grade
	YS	US	EL	H	YS	US	EL	H	
1	1.000	0.788	0.325	0.443	0.333	0.388	0.606	0.530	0.464
2	0.589	0.847	0.868	0.413	0.459	0.371	0.365	0.548	0.436
3	0.250	0.419	0.089	0.393	0.667	0.544	0.848	0.560	0.655
4	0.522	1.000	0.492	0.136	0.489	0.333	0.504	0.787	0.528
5	0.000	0.000	0.979	0.000	1.000	1.000	0.338	1.000	0.835
6	0.274	0.588	0.000	0.173	0.646	0.459	1.000	0.743	0.712
7	0.534	0.972	1.000	0.271	0.484	0.340	0.333	0.649	0.451
8	0.389	0.436	0.289	0.579	0.563	0.534	0.634	0.463	0.548
9	0.403	0.620	0.360	1.000	0.554	0.446	0.581	0.333	0.479

Table 8
Main effects on Grey grades.

Levels	1	2	3
Current (Amps)	0.518	**0.692**	0.493
Gas Flow Rate (ltr/min)	0.481	0.606	**0.615**
Speed (mm/sec)	0.575	0.481	**0.647**

dissimilar metals. This information helps lay a baseline for TIG welding process specifications and also demonstrates the significant factors affecting the TIG welding processes on dissimilar metals. The materials selected for dissimilar welding are AISI304 and SA213T22 and the chemical composition is given in Table 1. The diameter of the tube is taken as 60.3 mm, thickness is 4.5 mm and length is 250 mm. The electrode selected for similar welding is E309L whose dimension is 2.4 m in length. The argon is used as gas and its pressure is 3.5 kg/cm^2 during welding. The affecting factors and level selected for dissimilar welding AISI304 and SA213T22 is given in Table 2 and the experimental results of yield strength, the ultimate strength, Vickers hardness and the elongation of the metals is given in Table 3.

The physical properties of two metals are being very different from each other which lead to complexities in the weld pool shape, solidification microstructure and segregation patterns. Fig. 1 shows the micro-structure of the parent, head affected zone and the SA213T22 weld spot at magnification 200x. Fig. 2 shows the macro-structure of the dissimilar materials welding spot at magnification of 5x and the micro-structure of the AISI304 weld spot at

magnification 200x. It shows the macro-structure shows the dissimilar materials weld geometry such as reinforcement, width, penetration and weld bead.

3. Taguchi methodology

The main goal of the parameter design is to selecting the best process parameter to improve quality characteristics and to identify the product parameter values under the optimal process parameter values using Taguchi methodology. Moreever implementing that the optimal process parameter values obtained from the parameter design are insensitive to the variation of environmental conditions and other noise factors. Since the quality characteristic is to be maximization, the larger the better category is used to calculate the S/N ratio for responses Equation 1 shows the larger the better characteristic.

S/N ratio (η) = $-10 \log_{10}(1)$

Taguchi technique is used to find the optimum setting of dissimilar materials weld and experiments are conducted based on the L$_9$ orthogonal array. The aim function is maximization of the yield strength, ultimate strength, Elongation and Vickers hardness, so experimental results are converted to signal to noise ratio for reduction of variance using Eq. (1). The signal to noise ratio yield strength, ultimate strength, and elongation and Vickers hardness is presented in Table 4. The Taguchi analysis for yield strength and ultimate strength is given Table 5, it clearly shows that the optimal welding parameters for maximization of yield strength is

Table 9
General Linear Model: Analysis of Variance for YS.

Source	DF	Seq SS	Adj SS	Adj MS	F	P
A	2	12383.3	12383.3	6191.7	7.98	0.111
B	2	18686.9	18686.9	9343.5	12.05	0.077
C	2	9266.3	9266.3	4633.2	5.97	0.143
Error	2	1551.1	1551.1	775.6		
Total	8	41887.7				

S = 27.8487 R-Sq = 96.30% R-Sq(adj) = 85.19%.

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Table 10
General Linear Model: Analysis of Variance for US.

Source	DF	Seq SS	Adj SS	Adj MS	F	P
A	2	857	857	429	0.23	0.813
B	2	9308	9308	4654	2.51	0.285
C	2	4313	4313	2156	1.16	0.463
Error	2	3714	3714	1857		
Total	8	18,192				

S = 43.0931 R-Sq = 79.58% R-Sq(adj) = 18.34%

Table 11
General Linear Model: Analysis of Variance for EL.

Source	DF	Seq SS	Adj SS	Adj MS	F	P
A	2	6.22	6.22	3.11	0.10	0.911
B	2	139.39	139.39	69.69	2.19	0.314
C	2	116.22	116.22	58.11	1.82	0.354
Error	2	63.72	63.72	31.86		
Total	8	325.56				

S = 5.64456 R-Sq = 80.43% R-Sq(adj) = 21.71%.

Table 12
General Linear Model: Analysis of Variance for H.

Source	DF	Seq SS	Adj SS	Adj MS	F	P
A	2	1086.46	1086.46	543.23	5.76	0.148
B	2	286.01	286.01	143.00	1.52	0.397
C	2	376.60	376.60	188.30	2.00	0.334
Error	2	188.65	188.65	94.32		
Total	8	1937.72				

S = 9.71208 R-Sq = 90.26% R-Sq(adj) = 61.06%.

current set as 100 amps, gas flow rate 6 lit/min and welding speed set as 2 mm/sec. Optimal welding parameters for maximization of ultimate strength is current set as 100 amps, gas flow rate 6 lit/min and welding speed set as 2.5 mm/sec. The Taguchi analysis for Elongation and Vickers hardness is given Table 6, it shows that the optimal welding parameters for maximization of Elongation is current set as 130 amps, gas flow rate 8 lit/min and welding speed set as 3 mm/sec. Optimal welding parameters for maximization of Vickers hardness is current set as 130 amps, gas flow rate 10 lit/min and welding speed set as 2.5 mm/sec.

4. Grey relational analysis methodology

In this work, a grey relational approach has been applied to solve multi response optimization of yield strength, ultimate strength, elongation and Vickers hardness using grey relational analysis. The proposed steps can determine effectively the optimal factor level combination for multi response problems. It quantifies all influences of various factors and their relation, which is called the whitening of factor relation. As a result, optimization of the multi responses can be converted into optimization of a single relational grade. In short, there is an ample scope of applying the proposed methodology of grey relational analysis with the multiple responses for the optimization of yield strength, ultimate strength, elongation and vickers hardness.

The objective of the dissimilar material weld AISI304 to SA213T22 is maximization of yield strength, ultimate strength, elongation and Vickers hardness. This was termed as the larger the better type problem where maximization of the characteristic was intended. S/N Ratio was calculated for the responses using the larger the better formula Equations 1. The experimental result

and computed S/N ratios for yield strength, ultimate strength, Elongation and Vickers hardness are shown in Table 6. The S/N ratio values were normalized by Eq. (2) and grey relational co-efficient was calculated for the normalized S/N ratio values by using Eq. (3). The grey relational grade was computed from grey relational co-efficient for by Eq. (4). The normalized signal to noise ratio, grey relational co-efficient and grey relational grades are given in Table 7.The main effects were tabulated in Table 8 and considering maximization of grade values in Table 8 the optimal parameter conditions obtained were $A_1B_3C_3$. Multi response optimization of dissimilar material weld AISI304 to SA213T22 for maximization of yield strength, ultimate strength, Elongation and Vickers hardness, current set as 110 amps, gas flow rate 10 lit/min and welding speed set as 3 mm/sec.

In this study, the analysis of variance is used to find the statistically significant welding parameters. The analysis of variance for yield strength is given in Table 9. It clearly shows that the gas flow rate most significantly affects the yield strength with F:P value of 12.05:0.077. The analysis of variance for ultimate strength is given in Table 10. It mention that the gas flow rate most significantly affects the ultimate strength with F:P value of 2.51:0.285. The analysis of variance for elongation is given in Table 11. It represents the gas flow rate most significantly affects the elongation with F: P value of 2.19:0.314. The analysis of variance for Vickers hardness is given in Table 12. It denotes the current most significantly affects the Vickers hardness with F: P value of 5.76:0.148.

5. Conclusion

The function of the super heater coil is transfer heat energy, during transfer of high transfer damage happen in weld spot. So

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aim of the investigation is to study the performance of the dissimilar material AISI304 to SA213 T22 TIG welding the following are the outcomes

- Optimal TIG welding parameters for dissimilar material maximization of yield strength is current set as 100 amps, gas flow rate 6 lit/min and welding speed set as 2 mm/sec.
- Optimal TIG welding parameters for dissimilar material maximization of ultimate strength is current set as 100 amps, gas flow rate 6 lit/min and welding speed set as 2.5 mm/sec.
- Optimal TIG welding parameters for dissimilar material maximization of Elongation is current set as 130 amps, gas flow rate 8 lit/min and welding speed set as 3 mm/sec.
- Optimal TIG welding parameters for dissimilar material maximization of Vickers hardness is current set as 130 amps, gas flow rate 10 lit/min and welding speed set as 2.5 mm/sec.
- Multi response optimization of dissimilar material weld AISI304 to SA213T22 for maximization of yield strength, ultimate strength, Elongation and Vickers hardness, current set as 110 amps, gas flow rate 10 lit/min and welding speed set as 3 mm/sec.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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ORIGINAL PAPER

A Study of Added SiC Powder in Kerosene for the Blind Square Hole Machining of CFRP Using Electrical Discharge Machining

PV Arul Kumar[1] · J. Vivek[2] · N. Senniangiri[3] · S. Nagarajan[4] · K. Chandrasekaran[5]

Abstract

Carbon Fiber Reinforced Polymers (CFRPs) have been applied potentially for various application components owing to their lightweight and better mechanical properties. However, the machining of CFRP has been observed to be poor machinability due to the properties of the CFRP composites. Micro-feature fabricating on CFRP macro-component is a challenging task due to the selection of inadequate process parameters and machines. However, micron-level blind square holes are required in CFRPs for proposing the applications of micro-robotics, micro-vibration measurements, and micro-detection of cracking. These square holes produced on CFRP have the difficult task of being machined using the Electrical Discharge Machining (EDM) process. In this research, the effects of concentration of silicon carbide, pulse duration, duty cycle, and current on squareness, hole depth, and surface roughness of CFRPs are analyzed using Electrical Discharge Machining (EDM) with the square copper electrode. The input parameters, the various percentage of concentration of silicon carbide, pulse duration, duty cycle, and current for EDM are selected. The responses, squareness, hole depth, and surface roughness are considered. Also, an electrode wear length and surface defects have been analyzed. The modeling has been performed for selected responses. Additive Ratio Assessment (ARAS) is used for obtaining optimum parameters. The overall analysis found that the silicon carbide concentration and pulse duration are greatly affected all the responses. Also, the square electrodes produced unstable spark phenomena in the EDM process.

Keywords CFRP · EDM · Silicon carbide · Squareness · Depth

1 Introduction

Carbon Fiber Reinforced Polymers (CFRPs) are used in aerospace, satellite, electronic field, and commercial parts. The reasons for using these CFRPs are low density, high strength, low friction coefficient, high toughness, and good wear resistance. Square holes are required in CFRPs for proposing the applications of micro-robotics, micro-vibration measurements, micro-detection of cracks, micron-level

relative humidity measurements, micron-level - thermal strain measurements, micro - level -temperature measurements, detection of micro - delamination, and micro-fiber optics. Thereby, the square holes were fabricated on CFRP by using EDM [1–3], laser machining [4], mechanical drilling [5, 6], and micro-EDM [7]. Also, the square hole is mostly used in the precision manufacturing sector for manufacturing the micron-level square in the 3D micro-components for microfluid transportation purposes and

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has participated & presented a paper entitled __INCIDENCE OF FATAL__

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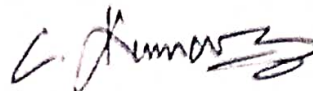
Department of Electrical and Electronics Engineering

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in the Virtual National Conference on "Recent Advances in Communicative Electronics (NCRACE 2021)" conducted by the Department of Electronics and Communication Engineering, SRM TRP Engineering College, Tiruchirappalli on 25.03.2021.

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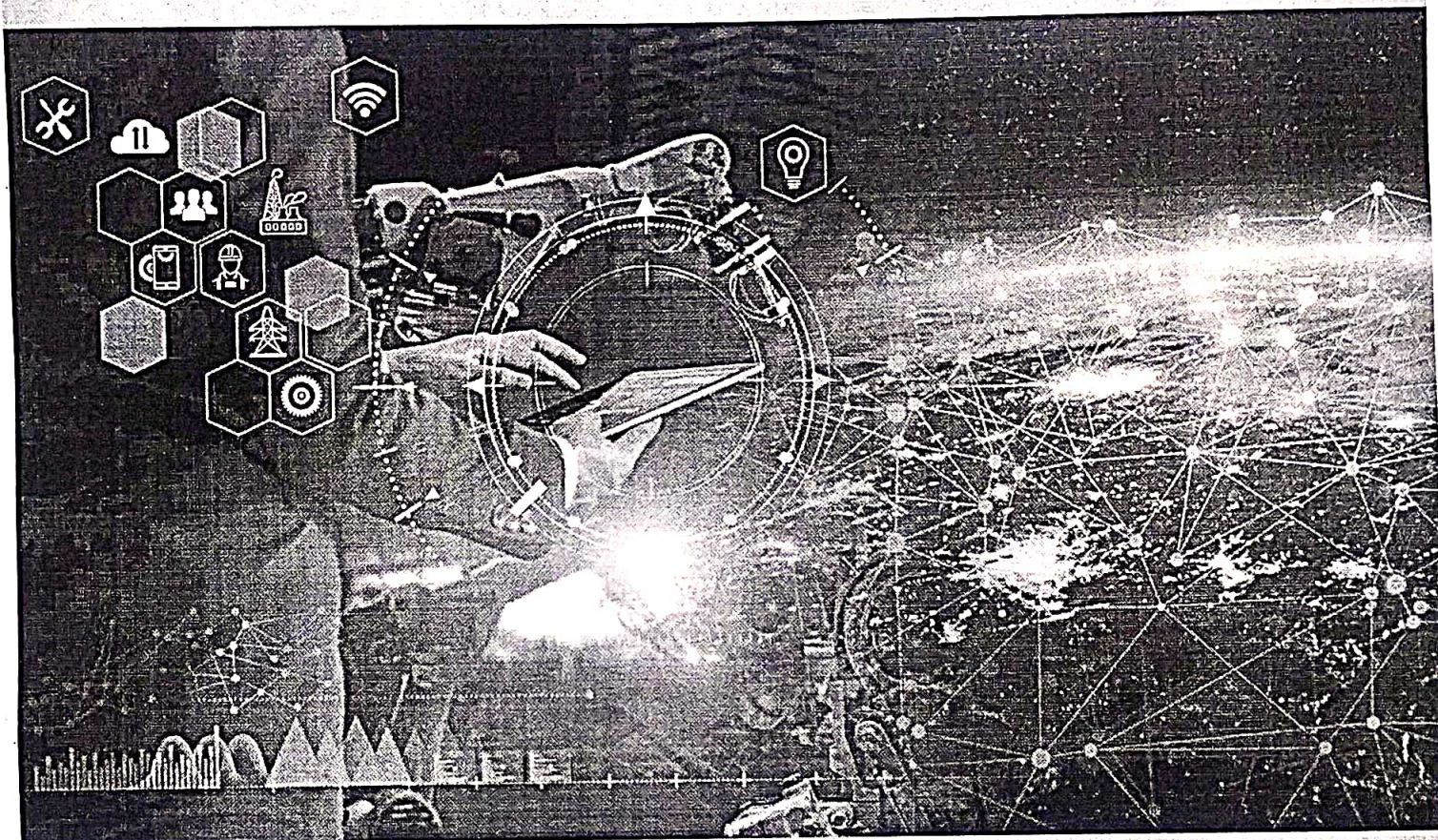
Chapter 17: Wireless Ad-hoc & Sensor Networks

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WIRELESS AD-HOC & SENSOR NETWORKS

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Abstract: Wireless Ad-hoc Sensor Networks (WASN) have become the most standard specialized advancement in business and mechanical applications. The utilization of WASN alongside Zigbee norms in Wireless Personal Area Networks (WPAN) has prepared for powerful data assortments with ideal utilization of network assets. Zigbee Technology is intended for minimal effort of arrangement, low multifaceted nature and low force utilization. This chapter presents an extensive audit on WASN and its routing protocols. This chapter additionally presents a point by point portrayal of Zigbee innovation, its different principles and empowering advancements.

Keywords: WASN, WPAN, Zigbee and QoS.

I. INTRODUCTION

WASN has become the most standard specialized advancement in business and mechanical applications for estimating and breaking down physical conditions and checking for security purposes, keen spaces and clinical frameworks [1]. In wireless connections the misfortunes can happen because of obstruction and blurring of the sign during transmission over significant distances. Consequently, to defeat these issues in WASNs, the Zigbee innovation created by Zigbee Alliance is utilized for powerful conveyance of services in WASN. The viable lifetime of

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the sensor hubs relies upon the battery. In dynamic sensor hubs, power devoured in keeping up topological control, data conglomeration, energy balance routing and hand-off hubs. The utilization of Zigbee in WASNs limits power utilization while keeping up ideal Quality of services (QoS) [2]. In this chapter the different innovative perspectives identified with WASNs and Zigbee innovation are portrayed.

II. WIRELESS AD-HOC SENSOR NETWORKS

WASNs is a subset of the Ad-hoc networks and doesn't need any foundation like base station, portable pinnacles, and so forth present in customary correspondence networks. WASN is broadly used to recognize occasions, to gather data and to communicate them to planned destination for investigation. WASN comprises of homogenous discovery hubs which speak with one another utilizing RF joins [3]. The sensor hubs comprise of three sections: sensors, microcontrollers and RF stations. The primary attributes of the sensor hubs are ease, with restricted registering limit and memory misused with restricted battery power. The microcontroller utilized in the sensor hubs have little RAM and glimmer memory size yet high clock speed. The WASN activity cycle is isolated into the accompanying stages [4]:

- Birth Phase: This is the beginning of an Ad-hoc wireless sensor network. This is a very energy demanding stage because of the association, arrangement and improvement. It is accordingly important to create instatement protocols with insignificant energy utilization.

- Life stage: It is next stage that is associated with full activity mode. It completes the recognition, the warning and the transmission of data. The fundamental target of this stage is to keep up the predefined quality of administration.

- Phase of death: This stage starts with the harm of the essential hub and the bringing down of the quality of administration. The start of the demise stage is diverse in various applications.

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In [5], creators have introduced a thorough writing review on wireless sensor networks. They have examined WASN as a blend of sensor, implanted methods and circulated data. They have additionally characterized Routing protocols dependent on three classifications which level, progressive and area with principle objective to expand the existence season of WSN.

Routing protocol is utilized by switch to decide the fitting way over which data is communicated. Fundamental assignments of the routing protocols are [6]:

- To learn accessible routes.

- Build Routing Tables.

- Make Routing choices the most limited way.
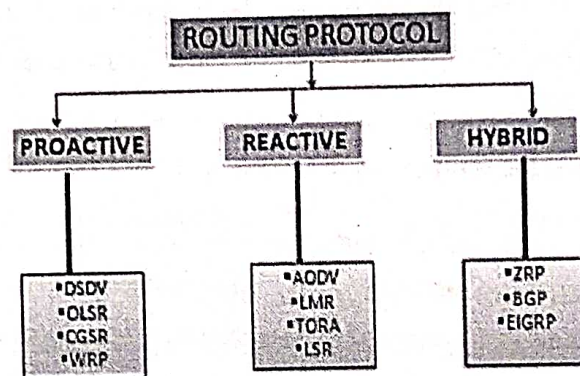
Figure.1: WASN Routing Protocol

Every one of these Routing protocol are clarified in detail beneath.

Proactive Protocol: In these routing protocols, every hub in the network keeps a routing table for all the neighboring hubs. The routing table is refreshed at whatever point there is an adjustment in network geography. In the event of progress in network geography, every hub sends a transmission message to the network with respect to the change [7]. Distance vector (DV) and Destination Sequenced Distance Vector (DSDV) Routing protocols are kinds of Proactive protocols.

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Reactive Protocol: These are on-demand routing protocols, in which the source hub develop a way just when a solicitation is gotten. It utilizes two way-ways from source to destination hub for successful correspondence [8]. Specially appointed on demand distance vector (AODV) and Label based Multipath Routing (LMR) are the instances of Reacting Protocol.

Hybrid Protocol: Hybrid protocol like Zone routing protocol and Border door Protocol are utilized to beat the drawbacks of proactive and reactive protocols by limiting the overhead of control message in proactive and diminishing the idleness issue in reactive routing protocols [9].

In [10] survey of Ad-hoc routing protocols are examined. It additionally incorporates different parametric correlations between DSR, AODV and DSDV. DSR gives better execution among all routing protocols. In [11], centers around the planning of a wireless networks and execution examination of various Routing protocols, for example, AODV, TORA, OLSR and DSDV. By looking at the exhibition of all routing protocols DSDV gives better execution in any Ad-hoc network by fluctuating boundaries like number of hubs.

In [12], execution examination of reactive and favorable to dynamic routing protocols like DSR, AODV (Reactive) and DSDV (proactive) has been talked about. On the off chance that we dissected the outcome every protocols has its own upsides and downsides. In [13], creator portrayed the presentation investigation of created model frameworks and its quality of administration boundaries can be discovered over view and non-view. In this paper creator reasoned that Zigbee based WSN is more appropriate for low data rate applications. It additionally gives the investigation of multi-bounce network which diminishes when contrasted with direct transmission regarding boundaries. The creator in [14], depicted two protocols (I) AODV (ii) DSDV. The presentation of these protocols has been examined twoly (I) keeping no. of CBRs consistent (ii) differing hubs from 10 to 50. The presentation measurements mimicked in this paper are throughput, jitter and normal start to finish delay. Creator reasoned that AODV perform better when CBR is consistent and hubs shifted. At the point when applied second condition, hubs consistent and CBR changed then additionally AODV beat among DSDV and ZRP. Henceforth it is inferred that AODV is better in all conditions.

In [15], Author portrayed that Ad hoc network and all routing protocols have been characterized based on their properties for Zigbee WPANs. Reactive protocols have been characterized here for IEEE standard 802.15.4 Zigbee protocol. Impromptu routing protocols have been characterized based on (I) Table driven, (ii) on demand (iii) Hybrid. Proactive routing protocols known as table driven and reactive known as on-demand routing protocols. Creator inferred that DSR is greatly improved as far as traffic burden and throughput than AODV (Ad-hoc on demand Distance Vector) and DYMO (Dynamic Manet on Demand). Be that as it may, regarding start to finish deferral and normal jitter it performs less when contrasted with both. DYMO is far superior to AODV in all examinations.

In [16], creator assess distinctive Mobile impromptu routing protocols actualized in WSN for ecological observing. Essential elements which portrayed for framework activity are (I) longer network life (ii) low inertness. The network is thought to be with one base station associated with a wireless wide area network, accepting the sensor estimations. The investigation zeroed in on the effect of quick versatility brought about by the surface developments. Creators reenact the effect of energy limitations and arbitrary way point portability design in physical layer and application layer of the hubs. As indicated by results AODV (Ad-hoc on demand distance vector routing) give better energy utilization.

III. ZIGBEE TECHNOLOGY

Zigbee is planned by Zigbee collusion and normalized by IEEE 802.15.4 detail is intended for the upper layer (network, security and application layer). Zigbee is utilized for low inertness wireless personal area networks (WPAN) gadgets and chips away at 3 frequencies band with 27 channels [17]. It is intended to devour less force when contrasted with Bluetooth, WI-FI and WI-MAX. It gives a most extreme throughput of 250 kbps in a scope of 10 to 100 m. Zigbee works in recurrence groups of 868MHZ, 902-924MHz and 2.4GHz. Figure 2 shows the Zigbee architecture which comprises of three layers: physical layer MAC layer and upper layer (network layer, application layer) [18].
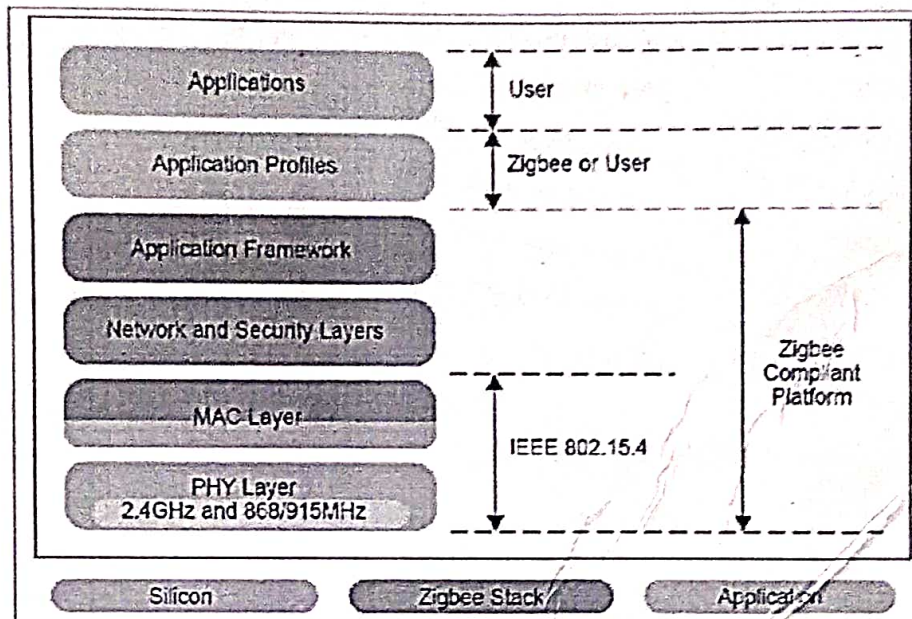
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Figure.2: Zigbee Layer Architecture

Physical Layer: Physical layer is characterized in IEEE 802.15.4 standard manages transmission and gathering of data. Most elevated reach Frequency band 2.4 GHz is all inclusive permit free band and is utilized at data pace of 250 kbps by 11 channels.

MAC Layer: It is utilized for broadcast data or sharing a medium is required then correspondence. There are two general classifications of MAC protocol: Contention based and Contention less. In transmission issue of collision happens when a few gadgets send data at same time. TDMA, FDMA and CDMA techniques are utilized to build up an appropriate channel and to evade the issue of collision.

Network Layer: The principle elements of network layer is blockage control, Routing , Inter-networking and manages start to finish conveyance of bundles.

Application Layer: It is the main layer and goes about as medium among clients and different layers. The fundamental elements of this layer are distinguishing conveying accomplices , deciding asset accessibility and synchronizing the correspondence.

Frame structure of physical and Medium Access Control Layer: Figure 3 shows the edge structure for Zigbee dependent on IEEE 802.15.4 plan. This protocol stack gives highlight to hubs to look through a current network, to shape new network or to participate in a network and supports the transmission or uncast tending to mode [19]. The MAC layer program gives data with respect to channel to be accessed, produces address data and affixss data bytes into MAC layer data outline. The Zigbee network facilitator access each end hub by pointing various varieties of destination address field consecutively.
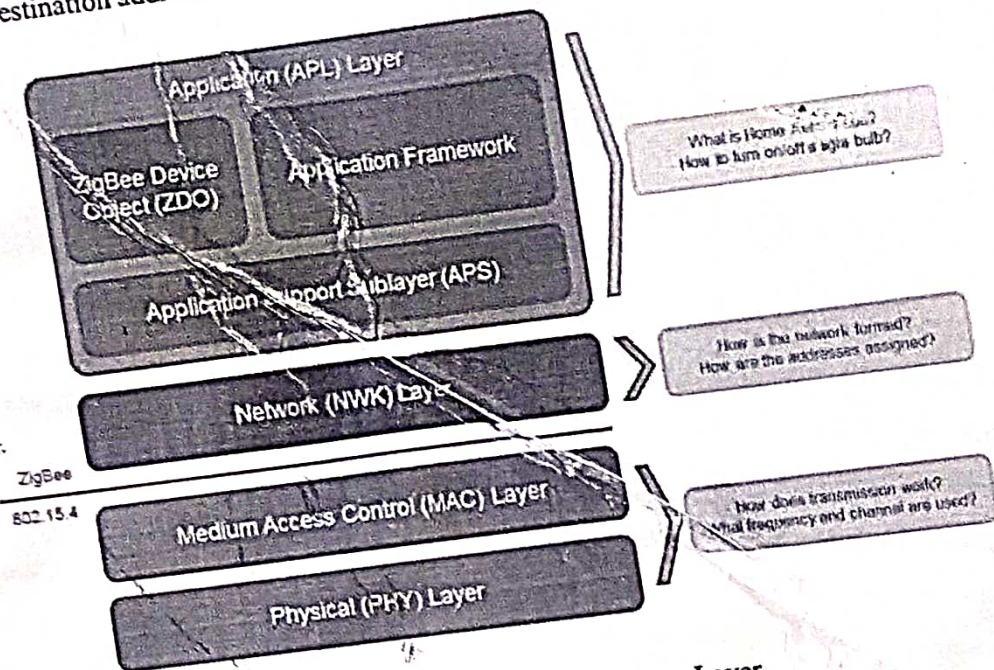
Figure.3: Zigbee Frame Structure Layer

In [20], creator examined around two basic elements for WSN (I) energy utilization (ii) network life time utilizing IEEE 802.15.4 standard for low data rate Wireless Personal Area Networks (WPANs). The superframe structure of Medium Access Control layer (MAC) in IEEE 802.15.4 permits gadgets to access diverts in a Contention Access Period (CAP) or Collision Free Period (CFP). In MAC layer Beacon based synchronization technique is utilized. IEEE 802.15.4 networks utilize two modes for data move which is signal and non reference point.

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Beacon mode go about as rest mode to beat the energy utilization while Non-guide mode goes about as affirmation mode to improve the correspondence dependability.

The data transfer happens twoly: Beacon mode and non-signal mode. In non signal mode the network is consistently in dynamic mode and continually screens the appearance of data consequently burns-through more force. It works in snoozing mode, on the grounds that whenever any bit can get up and impart. Guide mode works in rest mode on the grounds that, without a data message from the terminals, the switches and facilitators go into rest mode [21]. Sometimes the facilitator gets up and moves the data to the framework switches. The primary advantage of guide mode is the decrease of work cycles and delayed utilization of the battery. Periodic (sensor data), irregular (light switches) and dreary these kinds of data are overseen by reference point mode and non-guide [22].

IV. ZIGBEE SECURITY SERVICES

Key foundation, key vehicle, outline insurance and gadget approval are the fundamental services utilized by Zigbee Network for security purposes. The Zigbee security architecture incorporates three layer security system of protocol stack: Application, MAC and Network. Macintosh layer choose their security itself, yet application and network layer choose the degree of wellbeing to apply. The Advanced Encryption Standard (AES) in Zigbee configuration utilizes a vital size of 128 pieces. The fundamental keys utilized in Zigbee are Master, Network and Link [23].

The network key is an overall key utilized for key update purposes by all hubs of a network. Connection key otherwise called mystery session keys are utilized for correspondence between two gadgets. The methodology by which expert, connection, and network keys are produced, put away, handled, and shipped off gadgets computes the effectiveness and in general security of the whole network. Zigbee Trust Center (ZTC) is the crucial piece of the Zigbee security architecture and it worry about the entire Zigbee network. The principle assignment of ZTC are Trust the executives, network the board, setup the board, and to gather and apportion the keys of Zigbee gadgets.

In [24], creator has portrayed the applications of WSN for giving security in military, clinics and climate divisions. Creators have utilized WSN as two bits (nodes)(i) Crossbow "MICAz" bit (ii) Berkeley's "MICA2" bit. For improving security levels in WSN, the creators utilized two cryptographic

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plans utilizing lopsided key and symmetric key. After recreations the creators inferred that symmetric key plans are superior to topsy-turvy key plans in giving more noteworthy level of security while improving start to finish delay. In [25], Zigbee security architecture, security services, security model, security segments, security keys and the Trust Center, safety efforts of each layers have been portrayed. The creators profoundly contemplated and investigated the security component of Zigbee to additionally improve the security conspires and portray distinctive approach for development. In [26], Author portrayed security structure of Zigbee wireless network and its layers. Besides, it additionally characterized the confirmation and encryption in Zigbee innovation and proposes feelings for network security insurance, settles the classification trustworthiness and access control issue in network correspondence.

V. CONCLUSION

This chapter presents a hypothetical survey of WASN routing protocols and Zigbee application for WPAN. At last, presumed that WPAN utilizing Zigbee application has numerous preferences including ease, low force utilization, longer battery life, more noteworthy reach and high dependability in cross section networking. This chapter will assist scientists with getting data identified with Zigbee innovation at a solitary stage and assist them with pursuing their exploration in a productive and compelling way.

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Experimental Investigation and design Optimization of Roundness error of Micro drilling process on AISI316 sheets

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Abstract

The various methods for producing microstructures such as micro-holes which find wide spread application in highly sensitive products such as automotive fuel injection nozzles, watches, medical electronics, and camera parts requires a high degree of accuracy in its profile parameters. Micro drilling is the most ideal micromachining process to generate micro-holes, can generate deeper holes with better straightness, better roundness, and smoother surfaces. This paper focuses on micro drilling techniques that have been used in producing micro-holes along with the various strategies that have been adapted to improve the accuracy in hole dimensioning and its shape. The experiments are designed to L_{27} orthogonal array which contains spindle speed, feed rate and point angle are the input parameters and roundness error is a response parameter of micro drilling process in (AISI316) Austenite Stainless steel sheets. The experiments are conducted in Mini drilling machine and micro holes are produced by 0.5mm High carbon steel drill with help of micro drill jig. The optimum parameters of micro drilling process are predicted by using Taguchi design of experiment and analyzed by signal to noise ratio(S/N ratio) and analysis of Variance (ANOVA).Results lower roundness error is produced by lower level spindle speed, medium level feed rate and high degree of point angle of drill.

Keywords: Micro drilling, AISI 316 sheet, Drilling parameters, roundness error, Taguchi DOE, S/N ratio, ANOVA.

INTRODUCTION

Micro holes play an important role in manufacture of Printed circuit boards, Fuel injectors, Watch parts and micro dies. The experiments are designed to L_{27} orthogonal array which contains spindle speed, feed rate and point angle are the input parameters and roundness error is a response parameter of micro drilling process in Austenite Stainless steel. P.F. Zhang et al made a review on mechanical drilling process for titanium alloy which was based on micro drilling using different tools of diameter ranging from 0.05mm to 10mm with w/p material as Ti alloy. He discusses cutting force, cutting temperature, tool wear and tool life, hole diameter, surface roughness, burr and chip type as judging criteria while drilling of Ti using the mentioned processes. Boris Stirn et al has investigated the Burr Formation in micro drilling by using aluminium alloy and steel as Work material with drill bit size 130μm, 250 μm and 500μm. Machine parameters were diameter, cutting speed and feed rate where burr size and burr type were taken as the judging criteria. The influence of the cutting parameters on characteristic indices was observed and a comparison was being made. Dong-Woo Kim et al reported minimization of thrust forces in the step-feed micro drilling process. An orthogonal array of L27 was used to investigate the relationship between feed rate, step-feed, and spindle rpm with that of drilling Thrust. Author had found out optimal drilling conditions based on reliable experimental results to improve the productivity in micro drilling process. M. K.A Mohammed Ariffin et al reported an investigation to optimization of drilling cutting process which used the composite sandwich panel as testing material. Different type of drill bit material such as HSS and carbide drill bit of diameter 3mm were selected and 4 controlling parameters such as drill bit material, cutting velocity, feed rate and hole diameter were analysed by using statistical approach known as Design of Experiments. A total number of 120 holes were analysed using Regression analysis technique to obtain the optimized range of cutting speeds. Minimum damage length was obtained for both the drill bit material for different conditions of controlling parameters. Azlan Abdul Rahman et al investigated the effect of feed rate, Spindle Speed, Drill bit diameter on material removal rate, Surface roughness, burr and dimensional accuracy by taking drill sizes of 0.5 to 1.0mm. Comparative analysis was done between surface roughness, MRR and accuracy of drilled holes by experimentation. Experimental result shows the increment of spindle speed and feed rate value mostly affects the tool wear and size of burr on the drilled hole edges. S.Giridharan et al conducted experiments on drilling on EN-8 plates with different levels and parameters which designed by Taguchi Design of experiments. His represent larger metal rate is achieved high level of spindle speed and medium level of feed rate. Mohan et al (2005) have suggested that machining of fibre

reinforced Thermoplastics which influence of feed, drill size and Thrust force in Micro drilling process. The effect of high speed micro drilling of GFRP has been studied and it was observed with high speed machining will improve the productivity and lowering the production cost in Micro drilling process.

Rahamathullah et al (2011) have investigated that Thrust force and torque analysis for different strategies adopted in micro drilling process. The factors that limit the use of smaller drill size in drilling PCB and observed that high speed machining may increase the roundness error in micro drilling process..Chyan et al (1998) have been developed curved helical micro drill point technology for micro hole drilling. They explained that various sizes, geometries and materials of micro drills to meet requirements form industry such printed circuit board manufacture, MEMS, watch parts and camera parts. They also informed that Micro drills are employed to enable electrical interconnection between layers of board thus quality of holes are quiet significant for performance and reliability, especially in harsh environment.Klocke et al (2009) have discussed that size effects of Micro drilling process in steel which influence the cutting parameter. They also found realistic prediction of chip formation could be obtained by micro structure based Finite element model. The model is successfully validated for micro drilling of ferritic pearlite steel C05,C45 andC75.Finally conclude Thrust force and drill size influence the roundness error of Micro drilling process.Gupta et al (2013) have fabricated high speed micro drilling machine for achieving micro holes. They give clear idea about design parameters, vibration analysis and alignment test on various machine elements. They conduct micro drilling process parameters of copper plates and predict the response parameter. Higher material removal rate is achieved by medium spindle speed and higher feed rate in micro drilling process.

Thiren et al (2013) have conducted study on optimum drilling parameter of stainless steel plates in micro drilling process and found that surface roughness are mostly influence by spindle speed and feed rate. The Value of MRR is decreased by tool diameter and spindle speed decreases on micro drilling of stainless steel plates. They also found that by using cutting fluids effectively eliminates remaining chips and burrs to enhance the quality of drilled holes. Ashish Bharti et al (2013) have found that Multi response parameter of micro drilling process. Drilling operation is influenced by spindle speed, feed rate, tool point angle, coolant suppy, vibration, tool material and chip thickness. Based on Taguchi method along with ANOVA and DOE concept, output found as spindle speed and feed rate increases the material removal rate increases along with nominal micro drill diameter (0.5mm) but tool point angle has not significant effect and remaining constant in Micro drilling process.Katsumi et al (2002) have fabricated a small

drill of 22micrometer of diameter and 70 micrometer of length which is made of mono crystalline silicon. They are predict micro drilling generate deeper holes with better straightness, better roundness and smooth surface. They are also conduct experimental investigation of micro drilling on copper plates, higher spindle speed influence the lower surface, larger material removal rate, lesser thermal deformation and lower roundness error during micro drilling process. Basavarajappa et al (2008) have discussed that some studies on micro drilling process of hybrid metal matrix composites based on Taguchi technique. They are concluding feed rate and spindle speed have the most profound effect on micro drilling performance. The amount of roundness error increased with increases feed rate and spindle speed. A frequent cause of drill vibration is loose or poorly designed tool holder that imparts wobble to drill.

Chun-Hao et al (2009) have conducted that multi objective optimization of micro drill using grey relational analysis. They found that optimum settings of feed rate and spindle speed. So that the Thrust force, Torque, Local circularity error and machine time can be minimized. Furthermore the conscious drawn from small scale experiments are experiments are valid over entire experimental region spanned by the control factors and their level setting. The value of loss of function is further transforms into S/N ratio. Most of researchers conduct performance test only. Few researchers conduct optimization of micro drilling parameters for material removal rate and circularity error in micro drilling process for application bio medical and automotive.

EXPERIMENTAL DETAILS

The experiments conducted in AHUJA make Mini drilling machine using 0.5 mm drill with various spindle speed, feed rate and depth of cut on Austenitic stainless steel sheets(AISI 316), experiments are designed by Taguchi L27 orthogonal array and analyzed by Signal to noise ratio and Analysis of variance.(Fig 1&2)

Austenitic Stainless steel (AISI 316)

Stainless steel does not readily corrode, rust or stain with water as ordinary steel does, but despite the name it is not fully stain-proof, most notably under low oxygen, high salinity or poor circulation environments. It is also called corrosion-resistant steel.(Table 1)

- Specific Properties

- Excellent toughness

- Excellent corrosion resistance

- Excellent Heat Resistant

- Good Wear Resistant

- Minimum crack tendency

- High Hardenabilty

Table 1 Mechanical Properties of AISI 316

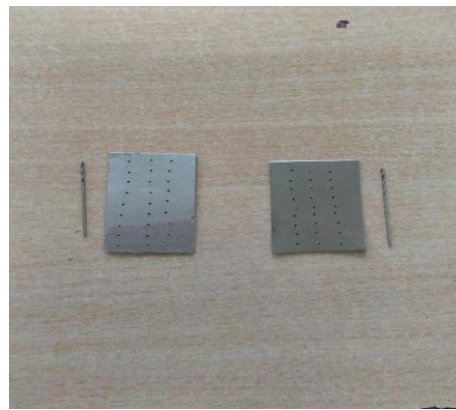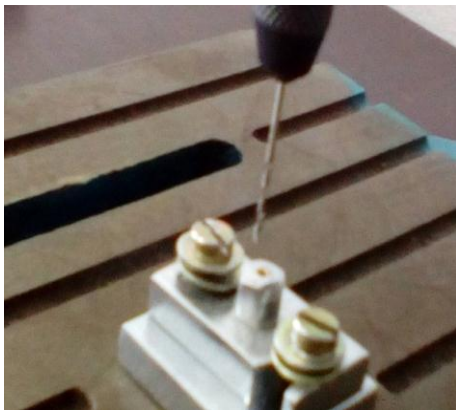| Max stress N/mm²	Yield stress Nmm²	Proof stress N/mm2	Elongation (%)	Impact Strngth (joule)	Hardness (Brinell)
950	510	450	18	32	89

Fig 1 Mini drilling machine with drill jigs

Fig 2 Micro drills on AISI316 steel sheets

RESULT AND DISCUSSION

Optimization of Micro drilling process

Micro drilling process of AISI 316 steel experiments are design as per DOE concept and select L 27 orthogonal array which contains 3 levels and 3 Parameters are conduct experiment using Taguchi design of Experiments. Table 2 show that Micro drilling process parameters.

Table 2 L $_{27}$ Design of Experiment with Micro drilling Process Parameters

Test No	Spindle speed (RPM)	Feed rate (mm/Rev)	Angle of drill (º)	Roundness error (mm)
1	1	1	1	0.06
2	1	1	1	0.08
3	1	1	1	0.04
4	1	2	2	0.05
5	1	2	2	0.06
6	1	2	2	0.08
7	1	3	3	0.06
8	1	3	3	0.02
9	1	3	3	0.04
10	2	1	2	0.06
11	2	1	2	0.03
12	2	1	2	0.08
13	2	2	3	0.07
14	2	2	3	0.09
15	2	2	3	0.10
16	2	3	1	0.12
17	2	3	1	0.11
18	2	3	1	0.13
19	3	1	3	0.14
20	3	1	3	0.13
21	3	1	3	0.15
22	3	2	1	0.18
23	3	2	1	0.20
24	3	2	1	0.22
25	3	3	2	0.24
26	3	3	2	0.22
27	3	3	2	0.26

Table 2 shows that response table for micro drilling process with different parameters and indicates spindle speed is dominating parameter of micro drilling process and produce lower roundness error during machining of AISI 316 steel sheets

Table 3 Response Table for Signal to Noise ratio

Level	Spindle speed	Feed rate	Angle of drill
1	25.07	21.86	18.82
2	21.32	19.64	20.19
3	14.46	19.35	21.84
Delta	10.61	2.51	3.01
Rank	1	3	2
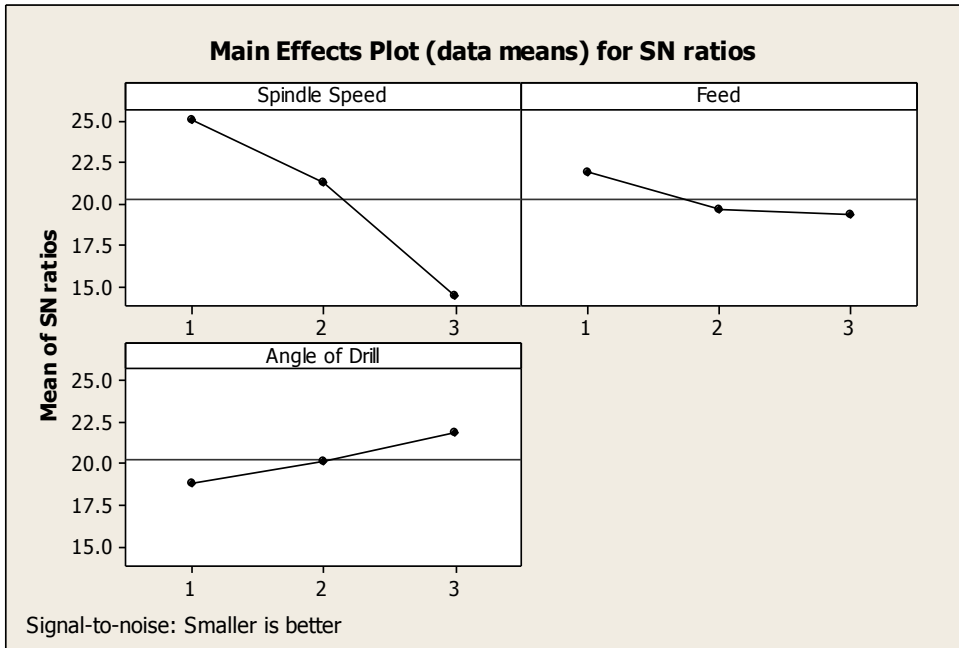
Fig 3 Main effect plot for micro drilling process on AISI 316 steel sheets

Fig 3 shows that Main effect plot for AISI 316 steel sheets on micro drilling process and achieve lower roundness error. It also indicates first level of spindle speed, First level of Feed rate and Third level of Angle of drill which dominating parameter of micro drilling process.

Table 4 Analysis of Variance of Micro Drilling process.

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Spindle speed	2	0.121007	0.121007	0.0605	142.8	0.000
Feed	2	0.007207	0.007207	0.0036	8.51	0.002
Angle of drill	2	0.004363	0.004363	0.0021	5.15	0.016
Error	20	0.008474	0.008474	0.0004	-	-
Total	26	0.141052	-	-	-	-

Table 4 shows that Analysis of Variance value of Micro drilling process which indicate the higher values of F is a dominating parameter of achieving lower roundness error on micro drilling process on AISI 316 sheets.

R square value of micro drilling process using analysis of variance method is 94.72& and contribute the maximum values are Spindle speed of high speed micro drilling process.
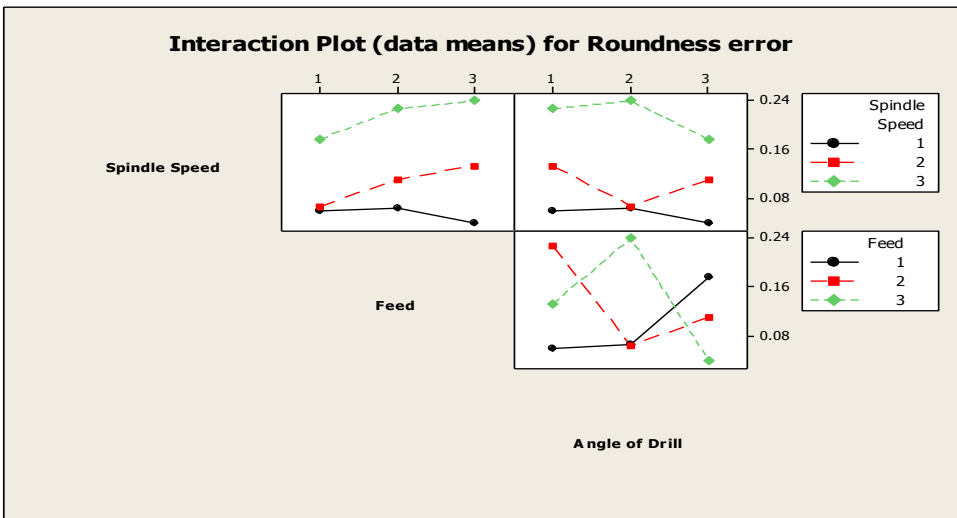
Fig 4 Interaction plot for Micro drilling process

Fig 4 shows that Interaction plot for Micro drilling process of Roundness error in AISI 316 steel sheets. It also represents Spindle speed ,feed and depth of cut are an Influencing parameters of micro drilling process. All the machining parameters are designed as per DOE concept are correct and produce lower roundness error.
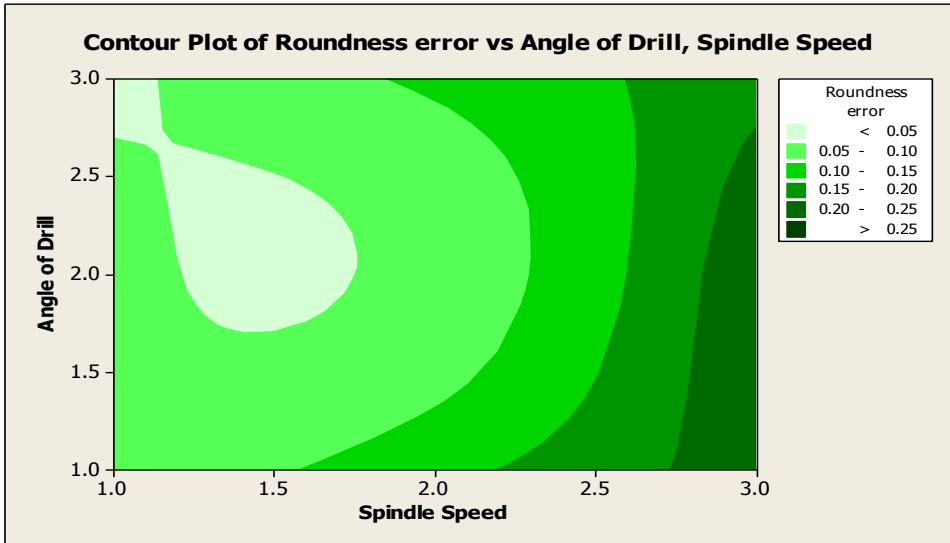
Fig 5 Contour Plot for Micro drilling process

Fig 5 shows that Contour plot for micro drilling process while achieving lower roundness error. It also represents first level of spindle speed and 3 level of angle of drill in micro drilling process for achieving lower roundness error.

CONCLUSION

In this experimental work Micro drilling is achieved in conventional mini drilling machine using special micro jig with degree of accuracy. The optimum parameter of micro drilling process for achieving lower roundness error is 500 rpm of spindle 0.04 mm /rev and 136 angle of drill. AISI 316 provided good machinability property. It can be used in Automobile fuel injectors and nozzle. The optimum parameter are analytically and graphically such as main effect plot and Interaction Plot which indicate response factors.

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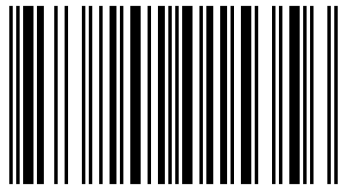
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MEMS is a promising technology in 2020 which is used to fabricate micro machines for micro factory concept. Pocket factory is a small dimension factory suitable for small production system with environment. It leads to sustainable manufacturing system such as economic, environment and social. The main objective of this work which implement micro factory concept in micro manufacturing system. Main features of pocket factory are energy efficient, table top portable, degree of accuracy, high speed and reliable.
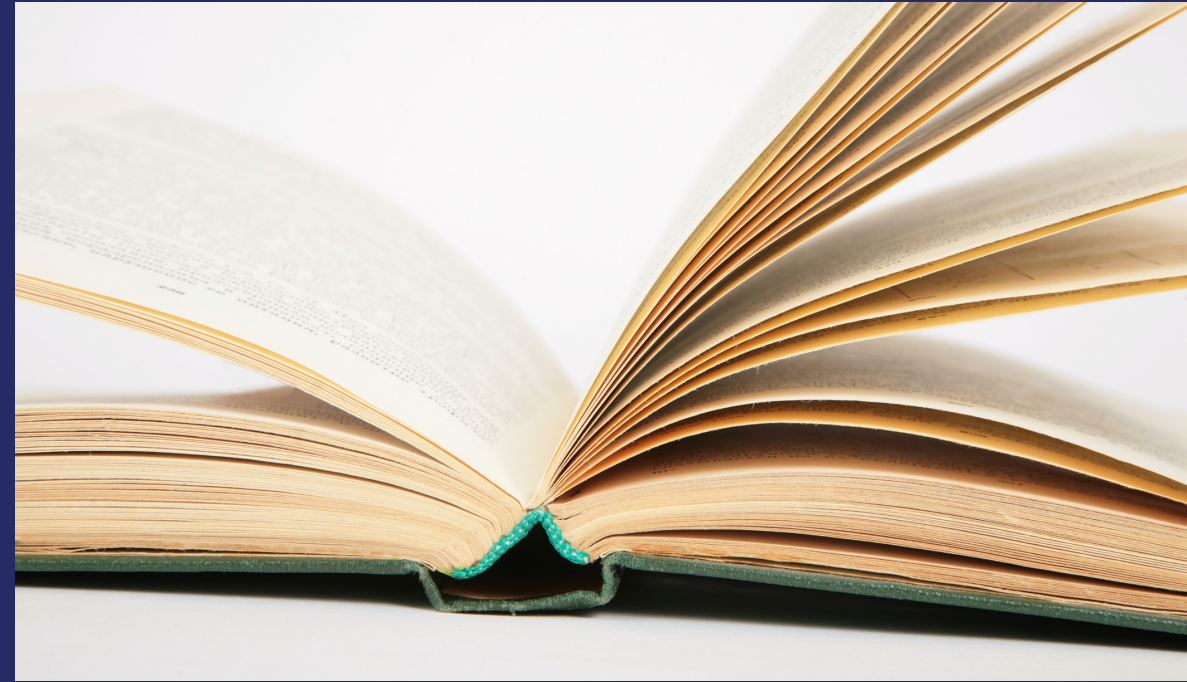
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Development of MEMS based Pocket factory for Sustainable manufacturing

SRM TRP
ENGINEERING COLLEGE

CERTIFICATE OF PARTICIPATION

This is to certify that **Ms.S.Muruka Valli** of **M.A.M School of Engineering** has presented a Paper titled **Scalable and Secure Big Data IoT System Based on Multifactor Authentication and Lightweight Cryptography** in the International Conference on Artificial Intelligence for IoT and Sustainable Electrical Networks (ICAIISEN'21) conducted by the SRM TRP Engineering College in association with IEEE SB, IIC, IETE and CSI on 29.04.2021.

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_____ **M.A.M School of Engineering, Tiruchirappalli** _____ has submitted / ~~presented~~ a paper titled

"Theft Identification System Based on Face Recognition using IOT" in ICEET 2020, Organized by

Parisutham Institute of Technology and Science, Thanjavur in association with ISTE.

Co - ordinator

Chief Co - ordinator

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(Convener – ICEET 2020)

Efficient Intrusion Detection System of Botnet Command and Control Traffic

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Abstract— **Nowadays high-speed computer networking and the Internet brought great convenience, a number of security issues also emerged with these technologies. Unfortunately, a new type of crime has also emerged along with the Internet: cybercrime and computer network security threats such as viruses and worms, botnets have become one of the most malicious threats over the Internet. Criminal attacks are launched from bots. Every single Internet-connected computer, containing: Personal Computers, mobile phones, network printers, embedded devices, and industrial process controllers, can be twisted into a bot by malware infection. In this project, we describe the issue in developing effective intrusion detection systems for botnet command and control traffic detection. Each detection method analyzes the network traffic to detect one technique used for command and control communications detection and block the connections. The three discovery methods are initially examined, these are: Untrusted Destination by Identifier (UDI), malicious SSL certificate, Traffic Flow Causality (TFC).**

Keywords— —*Cyber attacks, malware, botnet, server, intrusion detection system.*

I. INTRODUCTION

Botnets [1] [2] play an important role in cybercrime. A botnet consists of a large group of remotely controllable computers or bots. The bots are controlled by an individual or organization, referred to as the botmaster. Although there are some rare examples of botnets that perform legitimate tasks, most botmasters have malicious objectives and deploy bots exclusively for criminal operations. Without the knowledge or consent of the owner, computers are recruited as a bot by malware infection and subsequently deployed in diverse criminal activities, such as DDoS (Distributed Denial of Service) attacks, spam, click fraud, theft of sensitive information, and even cyber terrorism In this work the word botnet refers exclusively to malicious botnets. The botmaster communicates with the bots in a special communication infrastructure, referred to as the C&C (Command and Control) Infrastructure. The botmaster [3] is separated from the attacking bots by intermediate computers or stepping stones that complicate the trace back from discovered bots towards the botmaster by the C&C communication. The

trace back complexity is further increased when the stepping stones are distributed over several countries with different legislation Experts believe that approximately 16-25% of the computers connected to the Internet are members of botnets . One of the biggest recent distributed denial-of service (DDOS) assaults the Internet has ever witnessed against KrebsOnSecurity.com shows that the Internet of Things (IoT) is becoming a key target for attackers. The IoT botnet malware, dubbed 'Mirai', spreads to vulnerable connected devices by continuously scanning the Internet for easily hackable IoT systems protected by hard-coded passwords or factory defaults. It is difficult to accurately define a botnet . Although it is evident that a botnet is a set of bots, connected to a botmaster, this definition is not satisfactory without the definition of a bot. Communication plays an important role, but the sole ability of malware to connect to other malicious instances is not a sufficient condition to classify an infected computer as a bot. Modern malware is practically always a combination of different components for: infection, attack, concealment, adaption, and communication. Not only popular media, but even scientific literature, often refers to the same malware instances with different terms, such as: virus, root kit, backdoor, RAT, or trojan.

II. LITERATURE SURVEY

Most existing detection approaches in networks, it have limited results against botnet traffic that carefully imitates user originated visits to popular social websites, due to the close resemblance to legitimate traffic.

[1] **Sana Belguith** et al., proposed PAbAC, a novel privacy preserving Attribute-based framework, that combines attribute-based encryption and attribute-based signature mechanisms for securely sharing outsourced data via the public cloud. Our proposal is multifold. First, it ensures fine-grained cryptographic access control enforced at the data owner's side, while providing the desired expressiveness of the access control policies. Second, PAbAC preserves users' privacy, while hiding any identifying information used to satisfy the access control. Third, PAbAC is proven to be highly scalable and efficient

for sharing outsourced data in remote servers, at both the client and the cloud provider side.

[2]**Sana Belguith** et al., introduced PHOABE, a Policy-Hidden Outsourced ABE scheme. Our construction presents several advantages. First, it is a multi-attribute authority ABE scheme. Second, the expensive computations for the ABE decryption process is partially delegated to a Semi Trusted Cloud Server. Third, users' privacy is protected thanks to a hidden access policy. Fourth, PHOABE is proven to be selectively secure, verifiable and policy privacy preserving under the random oracle model. Five, estimation of the processing overhead proves its feasibility in IoT constrained environments.

[3]**Ibrahim ghafir** et al., proposed a novel approach, called BotDet, for botnet Command and Control (C&C) traf_c detection to defend against malware attacks in critical Ultra structure systems. There are two stages in the development of the proposed system: it has developed four detection modules to detect different possible techniques used in botnet C&C communications and 2) we have designed a correlation framework to reduce the rate of false alarms raised by individual detection Modules. Evaluation results show that BotDet balances the true positive rate and the false positive rate with 82.3% and 13.6%, respectively. Furthermore, it proves BotDet capability of real time detection.

[4]**Prerika Agarwal,** Implementation of signature-based detection system using snort in windows, Snort is a signature-based IDS capable of monitoring and analyzing network traffic to match signatures of known botnets. Snort consists of many components working together in order to detect malicious patterns in the traffic. Packets from network interfaces are captured by the packet decoder and they are prepared to be pre processed or sent to the detection engine. Then, packets are checked against specific plugins by a processor, and if anomalies are found, the processor raises an alert.

User traffic profile for traffic reduction and effective botnet C&C detection, Host-based approach for botnet C&C communication detection. This approach analyses suspicious flows produced by filtering out benign traffic from the traffic created by a host. A normal profile of the host traffic is used for the filtering. The behavioral pattern of flows to all destinations is examined in a bid to generate the host profile. This approach achieved a detection rate of 100% and false positives of 8%.

[5]**Banf** Detection and classification of different botnet C&C channels, Host-based detection method able to detect the existence of botnet C&C traffic on the observed machine, and also categorize the type of C&C communication used by the bot, e.g., peer-to-peer (P2P) based, HTTP-based or IRC-based. As it does not examine the packets payloads, their detection method is independent of the content of the C&C messages. Their method for detecting and categorizing

botnet C&C connections is based on three hypotheses: (1) it is possible to distinguish between botnet C&C communication and botnet non-C&C communication, (2) it is possible to distinguish between botnet C&C communication and valid communication and (3) there are shared characteristics between different styles of C&C and different botnet families.

Exploiting temporal persistence to detect covert botnet channels, Host-based detection method for botnet C&C traffic detection. This method is based on the fact that the infected machines should stay in contact with C&C severs to be instructed and controlled by the botmaster. It is assumed that those connections

III. EXISTING WORK

Recently many countermeasures have been deployed against botnets. Apparently there has been no decisive countermeasure, because botnets are since many years the most important instrument of Internet related crime and massive numbers of computers are part of botnets. The continuous media attention also indicates that botnets are still a real and unsolved threat. According to the recent research in worldwide there is still a spam rate of 69% of all mail. Spam is almost exclusively sent by botnets.

A. Disadvantages

- Most of detection method uses signature-based detection, it can be used for detecting only known botnets.
- Botnet C&C traffic detection uses honey nets. However, honey nets are not always capable of detecting bot infection.
- There is no flexible and extensible intrusion detection system.

Lack of handling network traffic in the real-time.

IV. PROPOSED WORK

In this project focused on network-based detection and host based detection of bots in Internet-connected networks with regard to the botnet threat and botnet detection. Invisibility is an important factor in botnet survivability; fortunately the invisibility of a botnet has practical limitations. Important causes that limit the invisibility are attack traffic, malware installation, limited resources and other survivability measures. The proposed work based on three major detection methods such as Untrusted Destination by Identifier (UDI) malicious SSL certificate, Traffic Flow Causality (TFC) and it is used to analyze and detect the malicious network traffic in real time.

A. Advantages

- The framework that analyzes and detects hidden botnet C&C.
- Botnet C&C traffic is detected by the observation of direct causes of traffic flows.

- To reduce the rate of false alarms raised by individual detection modules.

B. *Objective*

- Identify the method that are used in existing network-based C&C detection approaches and identify specific new approaches of networks that may lead to new detection approaches.
- Estimate the detection performance of these new approaches.
- To reduce the attacks such as ransomware or bot malware in real time network.
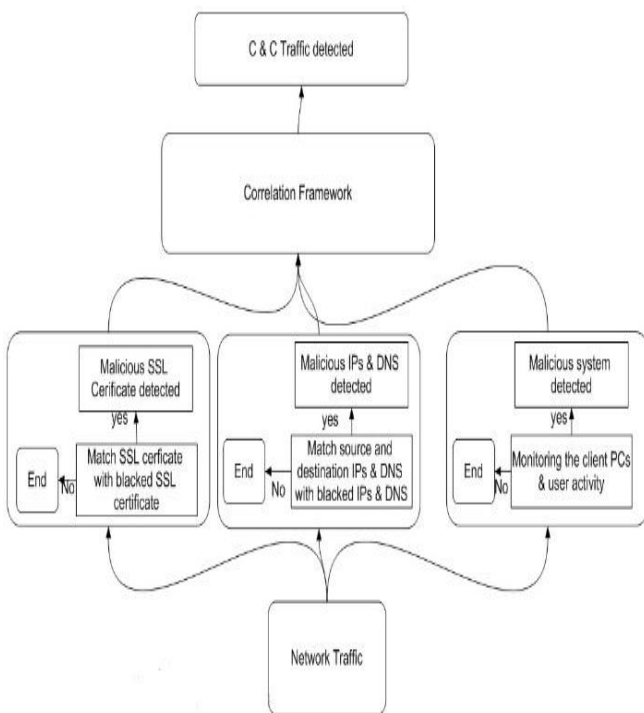
V. SYSTEM ARCHITECTURE

Fig. 1. System Architecture

Our proposed approach for botnet C&C traffic detection is outlined. This approach is based on the correlation between the events, which are the outputs of the detection modules. Fig 1 shows the two main

phase's communication. To this end, three detection modules have been proposed: Botnet C & C by SSL certificate detection module, Botnet C & C by untrusted destinations detection module and Botnet C & C by causal analysis of traffic flows detection module. Each detection module is independent of the other modules and aims to detect one technique that can be used in C&C communication. The outputs of these detection modules should be submitted to the second phase where they are correlated to raise an alert and block on botnet C&C traffic detection. In the second phase, the correlation framework takes events (the outputs of our detection modules) as an input and correlates them to raise an alert and block on botnet C&C traffic detection. The correlation method is based on voting between the detection methods to make the final decision about the detection.

A. ALGORITHM FOR IP BASED DETECTION

- **Input** : Message from NN;
- for each new flow NN_IP do
- Read the NN_IP;
- X= NN_IP;
- if X.equals.BOTN_IP
  X .Status = ANOMALOUS;
  signalAnomaly(X);
- Show(x);
- else
- X .Status = getStatusOfAssociatedFlow(X);
  if X .Status = NORMAL then
  extractForwardReferences(X);
- end if
  end if
  end for

B. ALGORITHM FOR DNS BASED DETECTION

- **Input** : Message from NN;
- for each new flow NN_DNS do
- Read the NN_DNS;
- Y= NN_IP;
- Estimate the detection performance of these new approaches.
- To reduce the attacks such as ransomware or bot malware in real time network.

V. CONCLUSION

In this work, we propose a method that can recognizes web-based bots in supervised network by modeling the network behavior of bots. On statement of activities for plenty of web-based bots, we notice that connections carrying C&C communication or other actions for a web-based bot are parallel in statistical meaning and these similar connections also appear periodicity despite the parameters of the features are different. Our work goals extracting this common network behavior shared by web-based bots and making detection models spontaneously. The proposed methodology does not rely on either payload evidence or bots' group-activities. Consequently, we can notice web-based bots with encrypted communication and the single infested bot in supervised network. The evaluation shows that our proposed methodology can discover web-based bots with a low false ratio.

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3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years (10)

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication
			Academic Year 2019-2020				
1	Vinothini K Senthamarai Kannan A		Optimsl Design method of Interleaved Boost PFC for improving Efficiency from Switching Frequency Boost inductor and Output Voltage		Electrical Power and Energy Syatems-2K20	National	2019-2020
2	Vinothini K		An Intergrated Step-Up Inverter without Transformer and Leakage Current for Grid Connected Photovoltaic System		Robotics & Automation Engineering-2K20	National	2019-2020
3	G.Purushothaman M.Ismailgani		Modelling and Implementation of Fixed Switching Frequency Sliding Mode Controller for Negative Output Elementry Luo-Converter		Electrical Power and Energy Syatems-2K20	National	2019-2020

4	Senthamarai Kannan A	Modelling and Analysis of Induction motor drive with Novel H bridge inverter	International Conference on Recent Innovations and Developments in Mechanical Engineering (ICRIDME 2K19)	International	2019-2020

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This is to certify that Mr./Ms./Dr. VINOTHINI K

has presented a paper titled on Optimal Design Method of Interleaved Boost PFC For Improving Efficiency From Switching Frequency Boost Inductor and output Voltage in the

fifth - National conference on **"Electrical Power and Energy Systems-2K20"**

Organized by Department of Electrical and Electronics Engineering,

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Department of Mechatronics Engineering

in Association with

National Conference on

ROBOTICS & AUTOMATION ENGINEERING - 2K20 (NCRAE-2K20)

Certificate

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of ...MAM SCHOOL OF ENGINEERING... Presented a technical paper

entitled AN INTEGRATED STEP-UP INVERTER WITHOUT TRANSFORMER & LEAKAGE CURRENT FOR GRID-CONNECTED PHOTOVOLTAIC SYSTEM.

in the National Conference on **"Robotics & Automation Engineering - 2K20"** held at

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in 2ⁿᵈ INTERNATIONAL CONFERENCE ON RECENT INNOVATIONS AND DEVELOPMENTS IN MECHANICAL ENGINEERING (ICRIDME 2K19) Organized

by Department of Mechanical Engineering, BIHER, Chennai on 15ᵗʰ November 2019.

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Title of the Paper : Online Shopping Using Semi Automated Robot In Super Market

Author : M. Chandra Sekar

M.A.M School Of Engineering

Prof. S. PALANIYAPPAN
Coordinator

Dr. M. PRABHAKAR
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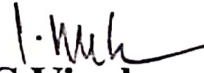
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a paper titled .... UNDERGROUND ARMY COMMUNICATION USING WUSN ....

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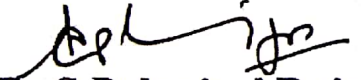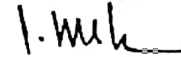
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has presented a paper titled on **Optimal Design method of Interleaved Boost PFC For Improving Efficiency From switching Frequency Boost Inductor and output voltage** in the

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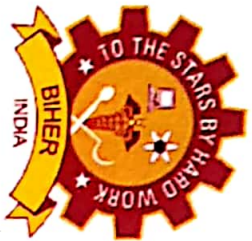KONGUNADU COLLEGE OF ENGINEERING AND TECHNOLOGY on 07.03.2020

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by Department of Mechanical Engineering, BIHER, Chennai on 15th November 2019.

Dr.R.J. Golden Renjith Nimal

Ms. C.M. Meenakshi

Co - ordinators

Dr. K. Balasubramanian

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CODE TRACKER: A LIGHTWEIGHT APPROACH TO TRACK AND PROTECT AUTHORIZATION CODES IN SMS MESSAGES

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Abstract:
Smart phones are widely used in our daily life. Most of the peoples use smartphones for online transaction, bank transfer and other application. By increasing the websites and application the authorization code are delivered via smartphones. SMS Authorization codes plays important role in securing web accounts, social accounts, money transaction and so many. So we approach a Code Tracker method to secure and track the authorization code in SMS message. At first the authorization codes are identified and marked with taint tag. Then we modified the array structure, array operations and file operation for the secondary storage and make sure the taint tags are not removed. Then the authorization code has been processed in many location. It has been moved or copied to various locations. And then determined the correct place for pre-defined the SMS authorization code and make sure the codes are not stolen.

I.INTRODUCTION

Android is a mobile operating system developed by Google. It is based on a modified version of the Linux kernel and other open source software, and is designed primarily for touchscreen mobile devices such as smartphones and tablets. In addition, Google has further developed Android TV for televisions, Android Auto for cars, and Wear OS for wrist watches, each with a specialized user interface, **SMARTPHONES** are widely used in our daily life. Increasingly more users leverage smartphones for online transactions, bank transfers and other operations. Simultaneously, increasingly more websites and applications (apps for short) leverage codes delivered via SMS messages to authorize users. it may present security concerns On the other hand, SMS-stealing malware is emerging. A research report from the Qihoo 360 company revealed that 6:1% of mobile malware is stealing information. Among these information-stealing malware samples, 67:4% of them are targeting SMS messages. A research paper noted that among the 49 malware families, 27 of them are harvesting user information, including user accounts and short messages. To this end, there is an urgent need to protect the SMS authorization codes in smartphones .

II.INTERFACE

Android's default user interface is mainly based on direct manipulation, using touch inputs that loosely correspond to real-world actions, like swiping, tapping, pinching, and reverse pinching to manipulate on-screen objects, along with a virtual keyboard app icons launch the associated app, whereas widgets display live, auto-updating content, such as a weather forecast, the user's email inbox, or a news ticker on the home screen. information and possible app actions right from the notification.

Applications ("apps"), which extend the functionality of devices, are written using the Android software development kit (SDK) and, often, the Java programming language. Java may be combined with C/C++, together with a choice of non-default runtimes that allow better C++ support.

In January 2014, Google unveiled a framework based on Apache Cordova for porting Chrome HTML 5 web applications to Android, wrapped in a native application shell.

Before Android version 4.4 (KitKat) [5], malicious apps could intercept SMS messages to retrieve authorization codes and then block the SMS broadcasting stealthily without informing users. However, starting with Android veersion 4.4, the SMS mechanism has been changed. Malicious apps are unable to block SMS broadcasting, and the system SMS app will get the SMS messages. However, malicious apps can still steal SMS messages by registering a broadcast receiver that listens to certain system events or requesting the READ_SMS permission to retrieve We SMS messages from the database. Which avoids data leakage (including SMS authorization codes). However , TISSA is currently implemented on legacy Android's Dalvik runtime and not the newly designed ART runtime. Secure SMS is another system used to protect SMS messages by changing the Android framework. In particular, when an SMS message arrives, Then, it stops the SMS broadcasting to prevent malicious apps from getting the message.,

Android Sms System

In Android, when receiving a text message, the system sends the message from the RIL (Radio Layer Interface) layer to the framework layer. The framework layer then packs the text message into an SMS PDU and sends a broad- cast indicating the receiving of an SMS message. All apps with the RECEIVE_SMS permission will receive the broadcast along with the SMS message if they have registered the SMS_RECEIVED_ACTION action.

1. **Title**: Artist: The Android Runtime Instrumentation and Security Toolkit

Authors: Michael Backes,Sven Bugiel, Sven Bugiel.

Abstract:

With the introduction of Android 5 Lollipop, the Android Runtime (ART) superseded the Dalvik Virtual Ma- chine (DVM) by introducing ahead-of-time compilation and native execution of applications, effectively deprecating seminal works such as Taint Droid that hitherto depend on the DVM. In this paper, we discuss alternatives to overcome those restrictions and highlight advantages for the security community that can be derived from ART's novel on-device compiler dex2oat and its accompanying runtime components. To this end, we introduce Artist, a compiler-based application instrumentation solution for Android that does not depend on operating system modifications and solely operates on the application layer. Since dex2oat is yet uncharted, our approach required first and foremost a thorough study of the compiler suite's internals and in particular of the new default compiler backend called Optimizing. We document the results of this study in this paper to facilitate independent research on this topic and exemplify the viability of Artist by realizing two use cases.

2. **Title**: Taint Droid: An Information-Flow Tracking System for Realtime Privacy Monitoring on Smartphones
Authors: William Enck,Peter Gilbert,Byung-Gon Chun.

Abstract:

Today's smartphone operating systems frequently fail to provide users with adequate control over and visibility into how third-party applications use their private data. We address these shortcomings with Taint Droid, an efficient, system-wide dynamic taint tracking and analysis system capable of simultaneously tracking multiple sources of sensitive data. Taint Droid provides real-time analysis by leveraging Android's virtualized execution environment. Taint Droid incurs only 14% performance overhead on a CPU-bound micro-benchmark and imposes negligible overhead on interactive third-party applications. Using Taint Droid to monitor the behavior of 30 popular third-party Android applications, we found 68 instances of potential misuse of users' private information across 20 applications. Monitoring sensitive data with Taint Droid provides informed use of third-party applications for phone users and valuable input for smart- phone security service firms seeking to identify misbehaving applications.

III. EXISTING SYSTEM

SMS messages does not have any special security system to secure the message. The android security system is the only thing that secure the messages.

Drawbacks

- It stop malicious apps from getting the information in messages
- The old methods are not good for the latest ART runtime devices.
- The third party software are not trustable because they are malicious or vulnerable.

IV. PROPOSED SYSTEM

- In this paper, we propose a new method called Code Tracker.
- At first we must identify whether the SMS system has the authorization code or not.
- If the SMS system has the authorization code it has been marked with taint tags.
- Then the authorization code has been processed in many location

Advantages:
- This method is suitable for all type of ART runtime devices.

- By using the inbuilt framework it will be trust

- It stop malicious apps from getting the information in messages.

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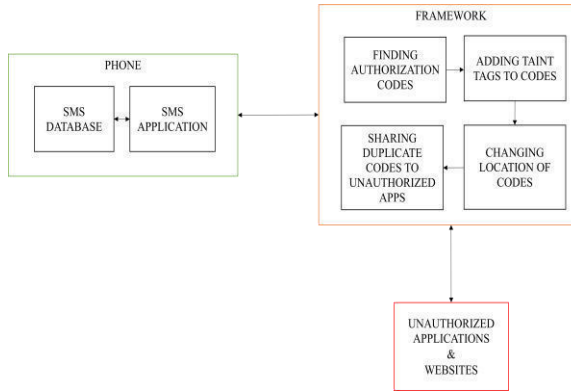
Authorization Code Identification

In the following, we will present how the taint tags are defined and how the authorization code is identified. We also present the way that we apply the taint tags to the authorization code.

The Definition of a Taint

In our system, each byte or character array contains a taint tag, as taint tag is a 32-bit integer data, and each bit has a specific meaning. We only define the meaning of the lower three bits, and we leave the remaining bits for future extension. If the data contain a taint tag, the corresponding bit of the tag of the data will be set to 1; otherwise, it will be set to 0. To apply taint tags to the SMS authorization code, we define several different tags.
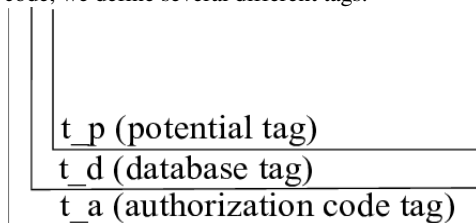
1. Figure of taint tag

Software Environment

The Java programming language is unusual in that a program is both compiled and interpreted. With the compiler, first you translate a program into an intermediate language called Java byte codes preter on the Java platform.
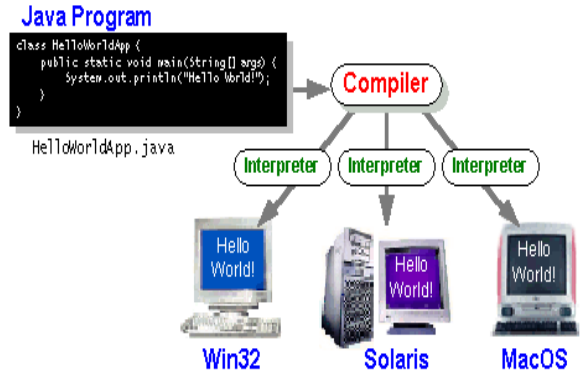
code instructions for the Java Virtual Machine (Java VM).
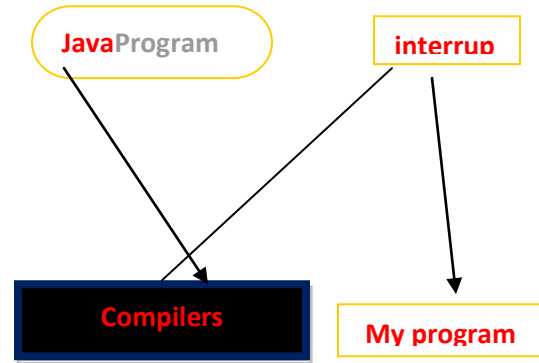
Networking

Tcp/Ip Stack

The TCP/IP stack is shorter than the OSI one:

Protocol) is a connectionless protocol.

IP datagram's

- The IP layer provides a connectionless and unreliable delivery system. It considers each datagram independently of the others. **Internet addresses**
- The Internet uses an address scheme for machines so that they can be located. **Network address**
- Class A uses 8 bits for the network address with 24 bits left over for other addressing. Class B uses 16 bit network addressing. **Host address Subnet address**
- the UNIX network is divided into sub networks.
- 8 bits are finally used for host addresses within our subnet. This places a limit of 256 machines that can be on the subnet.

Total address
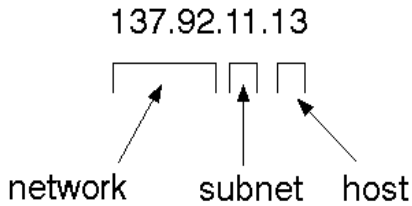
VII. DISCUSSION

In this section, we discuss some possible limitations of Code Tracker and potential future work.

A. Limitations

Many privacy tracking systems [8]_[10] cannot trace implicit data they can only track explicit data . Some anti-Taint Droid techniques are mentioned , such as removing taint tags through pixels, the alphabet, etc. so that they can escape from the tracking of Taint Droid .

J2ME (Java 2 Micro edition):-

Sun Microsystems defines J2ME as "a highly optimized Java run-time environment targeting a wide range of consumer products, including pagers, cellular phones, screen-phones, digital set-top boxes and car navigation systems." Announced in June 1999 at the Java One Developer Conference, J2ME brings the cross-platform functionality of the Java language to smaller devices, allowing mobile wireless devices to share applications. With J2ME, Sun has adapted the Java platform for consumer products that incorporate or are based on small computing devices.

1. General J2ME architecture
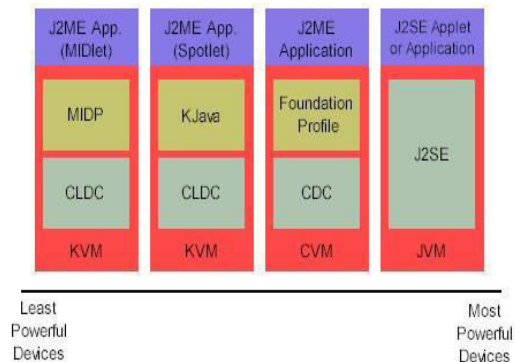
Future Work

First, Code Tracker is designed for the protection of SMS authorization codes, not for the protection of general text messages. However, in our decomplication process, we found that many malware apps steal general messages. Therefore, in the future, we can easily extend Code Tracker into a prototype system to protect all text messages by applying the taint tags to SMS messages and changing the security policies accordingly. Second, Code Tracker requires changes to the underlying framework; it cannot be transparently supported as a user-level solution. We may leverage a similar technique to Artist [10] to propose a pure user-level solution in the future .You can think of Java byte codes as the machine code instructions for the Java Virtual Machine (Java VM).

RELATED WORK

A. Protection Of Sms Messages

A variety of systems have been designed to prevent SMS messages from being leaked in smartphones. For example, Secure SMS [20] and other similar systems [21] _ [23] leverage cryptographic algorithms to encrypt the SMS messages for con_dentiality, integrity and authentication services, which is a different goal compared to CodeTracker. SecureSMS [7] attempts to protect SMS messages by adjusting the apps' receiving sequence of text messages in the system so that the default SMS app can get the text message. Then, it blocks the SMS broadcasting to prevent malicious apps from getting the message. However, Secure SMS only works in Android versions prior to 4.4. Other systems
[24] _ [27] have also been proposed to prevent phishing messages. Specifially, these systems search the content of SMS messages to and URLs that might link to malicious apps for installation and then block users' dangerous operations. In contrast to these apps, CodeTracker aims to provide protection for authorization codes in SMS messages.

B. Static And Dynamic Analysis Systems

To understand the possibility of privacy leakages, a number of information-_ow analysis systems have been proposed by researchers. These systems can be classified into two main types. One type includes static analysis systems that perform analysis on the disassembled codes of apps, including

FlowDroid [28], ComDroid [29], AmanDroid [30], Droid-Force [31], CHEX [32], etc. However, the limitation of static analysis systems is that they cannot detect runtime information disclosure. Therefore, dynamic analysis systems have

been proposed to track the information _ows at runtime in apps. For example, TaintDroid [8] and several extended systems (including DataChest [33], NDroid [34], DroidBox [35], etc.) can enforce taint tracking for real-time privacy monitoring on legacy Dalvik (but not ART) runtime in Android. TaintART

[9] and ARTist [10] are two dynamic systems designed for the newly introduced ART runtime in Android and can be leveraged to track and protect sensitive data (including authorization codes) in smartphones. However, as mentioned in Section I, TaintART suffers from the issue of extensibility, and ARTist does not perform well for inter-application tracking, which impede their use for tracking and protecting SMS authorization codes.

C. Confinement Of Smartphone Apps

A number of systems have been implemented to limit apps' access to sensitive data. For example, Kirin [39] corned apps by preventing third-party apps from accessing private data. Flask Droid [40] achieves this goal by hooking

Android system services. AppCage [41] leverages two complimentary user-level sandboxes to interpose and regulate an app's access to sensitive APIs. To prevent potential

privacy leakage, Aurasium [42], AppGuard [43], TISSA [6],and RetroSkeleton [44] have been proposed to enforce _negrained access control on sensitive data. All these systems may be able to be leveraged to provide protection for sensitive data (including SMS authorization codes) on legacy runtimes (i.e., Dalvik) in Android, but not on the ART runtime. In contrast, Code Tracker works well on Android's ART runtime and can provide protection as well as tracking for authorization codes in SMS messages

IX. CONCLUSION

In this paper, we design a dynamic lightweight approach for tracking and protecting authorization codes in Android called CodeTracker. Specially, we leverage the taint tracking technique and mark authorization codes with taint tags at the origin of the incoming SMS messages and propagate the tags through the system. Then, we apply security policies

at the endpoints where the tainted authorization code

is being sent out. The evaluation results on real malware samples demonstrate the effectiveness of our system, and the introduced performance overhead is low

BIG DATA ANALYSIS FOR FRAME WORK COLLECTIONS

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Abstract:

Most scientific data consists of analyzing huge amount of data collected from different resources. Hence, parallel algorithms and frameworks are the important which can process huge volumes of data and meeting the requirements of performance and scalability entailed in such scientific data analyses. In this paper, we proposed a concurrent VM reconfiguration mechanism for big data tool which is Map Reduce on virtualized big data environments. Our reconfiguration enhances the input data locality of a virtual Map Reduce cluster. It adds cores to VMs to run local tasks temporarily by scheduling tasks based on data locality, and adjust the computational capability of the virtual nodes to contain the scheduled tasks unlike the traditional schemes which can leads to user-friendly configuration methods for big data resources.The need for a reliable mapping mechanism decreases these risks to a minimum. In distributed systems, faults or failures are limited or part. Mapping is a significant issue in big data; it is concerned with all the techniques necessary to enable a system to endure software faults remaining in the system after its development. The main benefits of implementing mapping in big data include failure recovery, lower cost, improved performance etc. When multiple instances of an application are running on numerous machines and one of the servers goes down, there exists a fault and it is implemented by fault tolerance. So in this project we can mapping mechanisms using failure detectors based on check points. In real time distributed system feasibility of task is very important because there is a deadline defined for each task and should be ended on or before its deadline even there is a fault in the system. This project aims to provide a better accepting of fault, mapping and mapping techniques used in the distributed real time environments.

Keywords—Mapping,Mining,Attribute Selection

I. INTRODUCTION

Distributed Computing Systems consists of variety of hardware and software components. Failure of any of these components can lead to unanticipated, potentially disruptive behavior and to service availability.

Fault – Can be termed as "defect" at the lowest level of abstraction. It can lead to erroneous system state. Faults.

may be classified as transient, intermittent or permanent. They can be of following types:

1.Processor Faults (Node Faults): Processor faults occur when the processor behaves in an unexpected manner. It may be of classified into three kinds:

Fail-Stop – Here a processor can both be active and participate in distribute protocols or is totally failed and will never respond. In this case the neighboring processors can detect the failed processor.

Slowdown – Here a processor might run in degraded fashion or might totally fail.

Byzantine – Here a processor can fail, run in degraded fashion for some time or execute at normal speed but tries to fail the computation.

Network Faults (Link Faults): Network faults occur when (live and working) processors are prevented from communicating with each other. Link faults can cause new kinds of problems like:

One way Links – Here one processor can send messages to other is not able to receive messages. This kind of problem is similar to that faced due to processor slowdown.

Network Partition – Here a portion of network is completely isolated with the other.

Error – Undesirable system state that may lead to failure of the system

II. LITERATURE SURVEY

2.1 Mapping in Real Time Distributed System

A faulty system due to any reason during processing some task can causes some damages. A task running on real time distributed system should be feasible, reliable and scalable. The real time distributed system such as nuclear systems, robotics, air traffic control systems, grid etc. are highly dependable on deadline. A fault in real time distributed system can result a system into failure if not properly detected and recovered at time. These systems must function with high availability even under hardware and software faults. Fault-tolerance is the important technique used to maintain dependability in these systems. Hardware and software redundancy are well-known effective

methods. Hardware fault-tolerance achieved through applying extra hardware like processors, communication links, resource (memory, I/O device) whereas in software mapping tasks, messages are added into the system to deal with faults. Fault should be detected by applying reliable fault detector followed by some recovery technique. Many fault detection techniques are available but it is necessary to apply appropriate fault detector. Unreliable fault detector can make mistake by erroneously suspecting correct process or trusting crashed process. Main focus is on hardware mapping in real time distributed system. Software mapping is often overlooked. This is really surprising because hardware components have much higher reliability than the software that runs over them. Most system designers go to great lengths to limit the impact of a hardware failure on system performance. However they pay little attention to the systems behavior when a software module fails. There are many different techniques for software mapping(e.g. time out, audits, task rollback, exception handling, and voting). Most Real time systems must function with very high availability even under hardware fault conditions. The most useful hardware mapping techniques are redundancy and load sharing. For tolerating any fault from the system first we require to detect the fault occurred in the system and then isolating it to the appropriate unit as quickly as possible.

2.2 A Detailed Review of Fault-Tolerance Techniques in Distributed System

A distributed system is a collection of independent computers that appears to its users as a single coherent system. Distributed Computing uses multiple geographically distant computers and solves big and complex task very efficiently. In other words, a distributed system is a collection of independent computers that appears to its users as a single coherent system. Computing power of idle hosts is utilized by distributed computing. Distributed systems offer a better price and performance than mainframes. Computing power can be added in small increments in distributed systems. In this way incremental growth can be achieved. Distributed systems allow many users access to a common computing resource thus provides resource sharing. Thus it allows many users to share expensive peripherals. It makes human-to-human communication easier. As the size of distributed system is increasing day by day chances of faults are increasing. Mean time to failure is decreasing with increase in size and complexity of distributed system. In large and dynamic distributed system millions of computing devices are working altogether and these millions of computing device are prone to failures. Failures of processors, disks, memory, power, and link failure are some examples of failures. Faults are inevitable in larger and dynamic distributed system. Faults may stop or halt execution of distributed system. It disturbs normal execution and may turn system execution in wrong direction. In air traffic control, distributed disaster system, railways reservation system, internet banking a single fault may lead to huge loss of money and even human lives. In such a situation, inclusion of mapping technique is essential. Mapping Techniques enable systems to perform tasks in the presence of faults. There are high chances that more than one fault may occur in distributed system.

2.3 Mapping in distributed system

A system failure occurs when the system behavior is not consistent with its specifications. A system consists of several components, more the number of components; the more are the things that could be faulty. Since failures are caused by faults, a direct approach to improve the reliability of a system is to try to prevent faults from occurring into a system. This approach is called fault prevention. The other approach is fault tolerance. The goal is to provide service despite the presence of faults in the system. The fault prevention methods focus on methodologies for design, testing and validation; whereas fault tolerant methods focus on how to use components in a manner such that failures can be masked. Here onwards, we will be discussing techniques for building fault tolerant distributed systems. Distributed computing is a field of computer science that studies distributed systems. The term distributed system is used to describe a system with following characteristics: it consists of several computers that do not share a memory or clock; the computers communicate with each other by exchanging messages over a communication network; and each computer has its own memory and runs its own operating system. The resources owned and controlled by a computer are said to be local to it, while the resources owned and controlled by other computers and those that can only be accessed through the network are said to be remote or global.

2.4 Mapping in grid computing: state of the art and open issues

Computational grid consists of large sets of diverse, geographically distributed resources that are grouped into virtual computers for executing specific applications. As the number of grid system components increases, the probability of failures in the grid computing environment becomes higher than that in a traditional parallel computing scenario. Compute intensive grid applications often require much longer execution time in order to solve a single problem. Thus, the huge computing potential of grids, usually, remains unexploited due to their susceptibility to failures like, process failures, machine crashes, and network failures etc. This may lead to job failures, violating timing deadlines and service level agreements, denials of service, degraded user expected quality of service. Thus fault management is a very important and challenging for grid application developers. It has been observed that interaction, timing, and omission faults are more prevalent in grid. Mapping is the ability of a system to perform its function correctly even in the presence of faults. The mapping makes the system more dependable. A complementary but separate approach to increase dependability is fault prevention. This consists of techniques, such as inspection, whose intent is to eliminate the circumstances by which faults arise. A failure occurs when an actual running system deviates from this specified behavior. The cause of a failure is called an error. An error represents an invalid system state that does not comply the system specification. The error itself is the result of a defect in the system or fault. In other words, a fault is the root cause of a failure. However, a fault may not necessarily result in an error; nevertheless, the same fault may result in multiple errors. Similarly, a single error may lead to multiple failures.

2.5 System Diagnosis and Mapping for Distributed Computing System: A Review

Hardware, software and networks cannot be totally free from failures. Mapping is a non-functional requirement that requires a system to continue to operate, even in the presence of faults. Distributed systems can be more fault tolerant than centralized systems. Agreement in faulty systems and reliable group communication are important problems in distributed systems. Replication of Data is a major mapping method in distributed systems. Recovery is another property to consider in faulty distributed environments. They contain safety problems in DCS are as Integration Problems, Interaction Problems and Problems of trusted relations. They had also proposed a model of safety in DCS, which support the complex protection of various DCS segments and resource forming the virtual computing

environment. The model comprises of protection of data transmission protocol, data transmission, safe communication channels, authentication and transfer/display of safety certificates, access rights to resources delimitation, privacy support of the users, trust in DCS, security control of DCS, security tools of DCS and modern standards in the field of DCS safety as components. Moreover they had mentioned that to reduce the vulnerability level in DCs and to avoid the losses of critical information, additional security mechanisms like security risk analysis in DCS should be taken.

III. EXISTING SYSTEM

Existing IT platforms and solutions for big data analytics are designed to operate on large clusters of processing nodes, located in the same data center (DC). Additionally, these platforms assume the availability of virtually unlimited resources, such as compute power and network bandwidth. When executing big data analytics in telecommunication clouds, however, these assumptions cannot be taken for granted anymore. First, telecommunication clouds tend to be highly distributed in nature, being built up as a constellation of micro DCs in the edge and/or access network. These micro DCs have the unique benefit to be located much closer to the end-user, which enables e.g. hosting lower latency services and location-aware processes. Second, if the data generation velocity is high and/or the size of the events is large, transporting this data over the network to a central DC may consume a significant portion of the available bandwidth, which overlooks that network bandwidth is a scarce and costly resource making the telecom network valuable to end-users. And presents Continuous Hive (soft mapping), a streaming analytics platform tailored for distributed telecommunication clouds. The fundamental contribution of Soft mapping is that it optimizes query plans to minimize their overall bandwidth consumption when deployed in a distributed telecommunication cloud. But existing system can't consider the mapping in distributed environments.

3.1.1 Disadvantages

There is no mechanism in fault tolerances.

May lead to lack of service availability due to multiple system failures on multiple failure points.

As the size increases there comes the challenge to handle the large Volume in big data.

IV..PROPOSED SYSTEM

Distributed big data computing provide many storage to the user. Now a day the user level is highly increased to utilize the services in big data computing. In big data computing the major problem vicinity is fault tolerance. Mapping is a major concern to guarantee availability and reliability of critical services as well as data transmission. In order to minimize failure impact on the system, failures should be anticipated and handle. Mapping techniques are used to predict these failures and take an appropriate action before or after failures occur. So we propose a mapping mechanism to detect and then recover from failures. Specifically, instead of simply using a query based configuration, we design a trust based method to detect failures in a fast way. Then, a checkpoint based algorithm is applied to perform data recovery. Our experiments shows that our method exhibits good performance and is proved to be efficient. And evaluate the performance of the system using latency and throughput parameters and visualized in distributed environments. Checkpoint is defined as a designated place in a program at which normal processing is interrupted specifically to preserve

the status information necessary to allow resumption of processing at a later time. Check pointing is the process of saving the status information.

Table 1.1.Data sets

4.1 . Objective of Purposed System

Distributed big data computing provide many storage to the user. Now a day the user level is highly increased to utilize the services in big data computing. In big data computing the major problem vicinity is fault tolerance. Mappings a major concern to guarantee availability and reliability of critical services as well as data transmission. In order to minimize failure impact on the system, failures should be anticipated and handle. Mapping techniques are used to predict these failures and take an appropriate action before or after failures occur. So we propose a mapping mechanism to detect and then recover from failures. Specifically, instead of simply using a query based configuration, we design a trust based method to detect failures in a fast way. Then, a checkpoint based algorithm is applied to perform data recovery. Our experiments shows that our method exhibits good performance and is proved to be efficient. And evaluate the performance of the system using latency and throughput parameters and visualized in distributed environments. Checkpoint is defined as a designated place in a program at which normal processing is interrupted specifically to preserve the status information necessary to allow resumption of processing at a later time. Check pointing is the process of saving the status information.

4.2 Modeling Map Phase

Cloud computing is sharing of resources on a larger scale which is cost effective and location independent. Resources on the cloud can be deployed by the vendor, and used by the client. It also shares necessary software's and on-demand tools for various IT Industries. In this module, we form the framework with various nodes. The nodes are used to transfer the data from one place to another. Distributed framework is used to communicate the information to various systems.
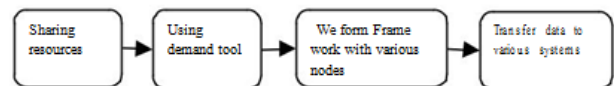

Figure 1.1 .Modeling Mapping

4.3. Design Rationale

We can create the datasets based data transmission and compared with training datasets. The datasets contains the information such as location details, data details, and attack details and so on. We can create two types of datasets such as training dataset and testing datasets. A training set is a set of data used in various areas of information science to discover network relationship. Training set has much the same role and is often

used in conjunction with a test set. A test set is a set of data used in network to assess the strength and utility of a predictive relationship. Test sets are used in networks to capture the data such as node id, protocol, attacks and so on. The test datasets are classified with training datasets.
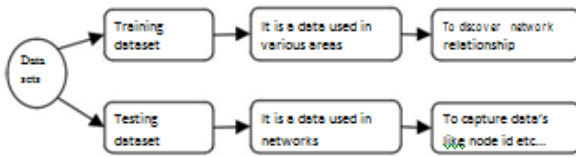

Figure:1.2. Design Rationale

4.4. Job Execution Estimation

A fault can be categorized on the basis of computing resources and time. A failure occurs during computation on system resources can be classified as: omission failure, timing failure, response failure, and crash failure. In this module predict the faults in distributed systems. Faults may be physical fault or attacker based faults. Fault-tolerance is the important method which is often used to continue reliability in these systems. We can implement the checkpoints are set during the process of job processing, which is overlapped with the failure detection process. That is, while we are monitoring the trust value of nodes, we need to preserve the checkpoint information as well.
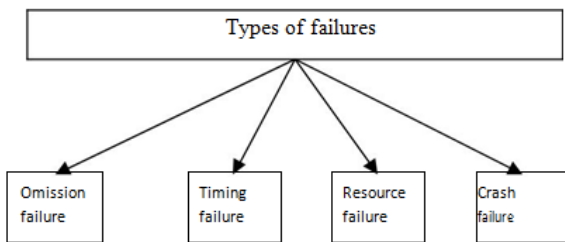
Figure 1.3 Job Execution Estimation

4.5 Resource Provisioning

We can evaluate the performance of the system using latency and throughput measurements. Latency is the delay from input into a system to desired outcome; the term is understood slightly differently in various contexts and latency issues also vary from one system to another. Latency greatly affects how usable and enjoyable electronic and mechanical devices as well as communications are. Latency in communication is demonstrated in live transmissions from various points on the earth as the communication hops between a ground transmitter and a satellite and from a satellite to a receiver each take time. Throughput is a measure of how many units of information a system can process in a given amount of time. It is applied broadly to systems ranging from various aspects of computer and network systems to organizations. Related measures of system productivity include the speed with which some specific workload can be completed, and response time, the amount of time between a single interactive user request and receipt of the response. Our proposed system provides reduce number of latency and high throughput compared to existing system.
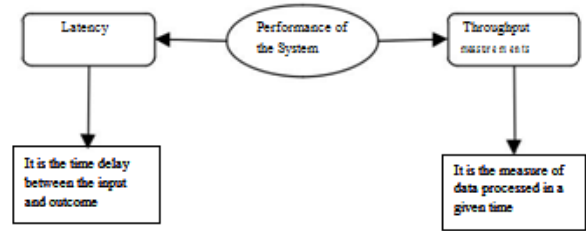

Figure : 1.4 Resource Provisioning

V. CONCLUSION

In this paper, we provide a brief introduction of the MapReduce technique. Most scientific data consists of analyzing huge amount of data collected from different resources. Hence, parallel algorithms and frameworks are the important which can process huge volumes of data and meeting the requirements of performance and scalability entailed in such scientific data analyses. One such popular and efficient framework is MapReduce which has acquired a lot of attention from the scientific community for its applicability in large parallel data analyses. Even though there are many assessments of the Map Reduce tool employing huge amount of textual data collections, only a few evaluations for scientific data analyses have been made. The explain the MapReduce programming model as: The calculation takes a group of input key/value pairs, and gives a group of output key/value pairs. The user of the MapReduce library states the computation as two functions: Map and Reduce. x Map, written by the user, takes an input pair and produces a set of intermediate key/value pairs. The MapReduce library clusters intermediate values associated with the same intermediate key and passes them to the Reduce function. The Reduce function, also written by the user, accepts an intermediate key and a set of values for that key. It merges together these values to form a possibly smaller set of values. The chapter contains an overview of current big data storage technologies as well as emerging paradigms and future requirements. The overview specifically included technologies and approaches related to privacy and security. Rather than focusing on detailed descriptions of individual technologies a broad overview was provided, and technical aspects that have an impact on creating value from large amounts of data highlighted. The social and economic impact of big data storage technologies was described, and three selected case studies in three different sectors were detailed, which illustrate the need for easy to use scalable technologies. It can be concluded that there is already a huge offering of big data storage technologies. They have reached a maturity level that is high enough that early adopters in various sectors already use or plan to use them. Big data storage often has the advantage of better scalability at a lower price tag and operational complexity. The current state of the art reflects that the efficient management of almost any size of data is not a challenge per se. Thus it has huge potential to transform business and society in many areas. It can also be concluded that there is a strong need to increase the maturity of storage technologies so that they fulfil future requirements and lead to a wider adoption, in particular in non-IT-based companies. The required technical improvements include the scalability of graph databases that will enable better handling of complex relationships, as well as further minimizing query latencies to big datasets, e.g. by using in-memory databases. Another major roadblock is the lack of standardize d interfaces to NoSQL database systems. The lack of standardization reduces flexibility and slows down adoption.

Finally, considerable improvements for security and privacy are required. Secure storage technologies need to be further developed to protect the privacy of users.

V. FUTURE ENHANCEMENTS

System virtualization is the backbone of Cloud computing, has been liberalizing its services to distributed data-intensive platforms such as MapReduce and Hadoop. In this paper, we proposed a concurrent VM reconfiguration mechanism for big data tool which is mapreduce on virtualized cloud environments. Our reconfiguration enhances the input data locality of a virtual MapReduce cluster. It adds cores to VMs to run local tasks temporarily by scheduling tasks based on data locality, and adjust the computational capability of the virtual nodes to contain the scheduled tasks unlike the traditional schemes which can leads to user-friendly configuration methods for cloud resources. For future work we will consider, create a framework to build relationships between datasets

ACKNOWLEDGMENT

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TRUSTWORTHY IN THE DYNAMIC IOT CLOUD

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Abstract:

In this paper, we consider the issues of trustworthy computing for the dynamic IoT cloud. First, we introduce the vertical and horizontal computing structures in the extended IoT cloud where IoT devices, edge, fog, and cloud are integrated in a layered infrastructure. Then, we consider the issues and design a framework and accompanying mechanisms for performing trustworthy computing making use of the vertical IoT cloud structure to secure the IoT cloud in vertical and horizontal computation structures. Specifically, we discuss a general trustworthy computing pattern in the IoT cloud and use intrusion detection as an example to illustrate the idea, develop an advanced access control and policy definition model for highly dynamic IoT networks, and introduce an integrated data provenance and information control mechanism to assure the data integrity and secure the information flow for various computation patterns in the IoT cloud.

Keywords—edge computing ,fog computing, role based access control, attribute based access control, resource hierarchy, relative role model, data provenance, information flow control, IoT cloud infrastructure.

I. INTRODUCTION

. Wireless sensor networks (WSNs) comprise of a large number of small sensing and self- powered sensor nodes distributed in a geographical region. The sensor nodes gather communicate in a wireless fashion. Sensing, processing information or detect special events and node is said to be faulty if it is not functioning communication are three key tasks whose combination in one tiny device gives rise to a vast number of remote sensing applications. Although WSNs provide endless opportunities, at the same time pose formidable challenges. Some of these challenges are low battery, less computational capabilities and inefficient use of communication resources. Among these impediments, the most difficult one is the mysterious data sent by an unknown faulty sensor node either to the fusion centre (FC) such as base station (BS) or to the neighbouring sensor node . In WSNs, the accuracy of the observed data sent by a sensor node is important for the overall network's performance.

Therefore, detection of faulty sensor nodes is an essential issue in WSNs .A sensor properly . In the literature, the faults in WSNs are broadly classified into two types known as hard fault (permanent or static fault) and soft fault (or dynamic fault) . The hard fault occurs if a sensor node fails to communicate with the rest of the sensor nodes in the network . When the sensor node is able to communicate with the other sensor nodes, but transmits erroneous message, then such type of fault is known as soft fault.

II. EXISTING SYSTEM

Open Flow provides an open protocol to program the flow table in different switches and routers. A network administrator can partition traffic into production and research flows of fault detection. Researchers can control their own flows - by choosing the routes their packets follow and the processing they receive. In this way, researchers can try new routing protocols, security models, addressing schemes, and even alternatives to IP. On the same network, the production traffic is isolated and processed in the same way as today. The data path of an Open Flow Switch consists of a Flow Table, and an action associated with each flow entry. The set of actions supported by an Open Flow Switch is extensible, but below we describe a minimum requirement for all switches. For high-performance and low-cost the data path must have a carefully prescribed degree of flexibility. This means forgoing the ability to specify arbitrary handling of each packet and seeking a more limited, but still useful, range of actions.

2.1 Disadvantages
* It needs to be aware of the specific technique supported in order to issue the corresponding commands.
* It is handled within each technology using its own mechanisms.

III. PROPOSED SYSTEM

In the proposed work, to minimize the computational complexity and improve the accuracy, each sensor node initially tests the presence of faulty sensor nodes in its neighbour, if found, then predicts the probable fault status of them. For this, the Neyman–Pearson (NP) detection method is used. The sensor nodes shared the predicted probable fault status of the neighbours with them. Then, each sensor node uses a fusion scheme to take the final decision on its fault status. The major contributions of this paper are (i) design and evaluation of an efficient distributed fault diagnosis algorithm for detecting soft faulty sensor nodes in large WSNs, (ii) the Neyman–Pearson (NP) detection method is used to detect the faulty sensor node (iii) the performance is compared with the existing distributed algorithms such as JSA and Jiang , and(iv) the algorithms are implemented in NS3 .The remaining part of the paper is organized as follows. In the related work which provides an exhaustive view about the previous work is discussed. The network model used for the development of the distributed algorithm is provided. The proposed distributed fault detection (DFD) algorithm is described .The analytical model which proves the correctness of the algorithm is also given . The many IOT devices are not powerful enough to perform traffic pattern analysis for intrusion detection also access control and privacy validation conventionally being carried out by centralized certification authority could be too computation intensive for some simple IOT computing infrastructure to perform trustworthy computing for IOT devices.

3.1 Advantages

* It allows different types of communication that have traditionally been handled separately to be integrated at a single decision point.

* It supports the implementation of a variety of mobility protocols.

Figure 2.1 System architecture
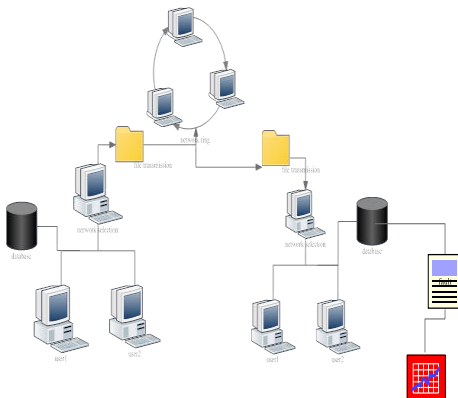
In the system architecture the source and the destination can be calculated using the TE algorithm to analysis the path to the source to destination and the different path and the forwarding node with different bandwidth can be selected. Then the frequency can be analysed to transmit the data. Then the data can be transmitted to the different forwarding nodes. Then the request and the response can be calculated. If the frequency changes the different path can be changed to transmit the data to the destination.

3.2 Nodes module

3.2.1 Nodes module

In this module it makes the users to deploy their own nodes in a process to transfer a file or any text document from one user to other users to calculate the time between different nodes from different places. The nodes can be mentioned as a separate system in the network and then the network can be created to make a data transmission in the network. Then the process can be further calculating the node details and then the source and the destination can be verified using the network creation and the node deployment in it.
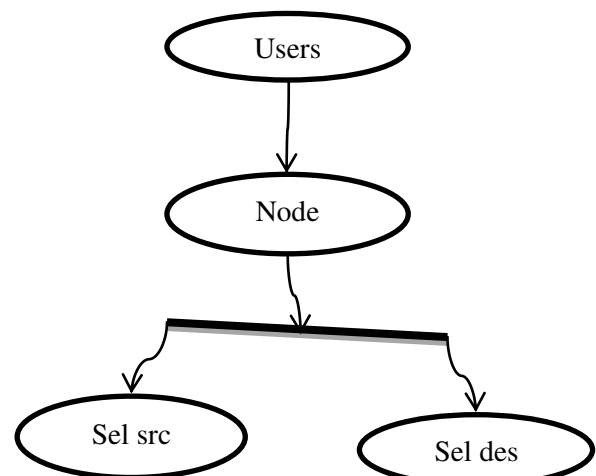
Figure 1.1. Node Module
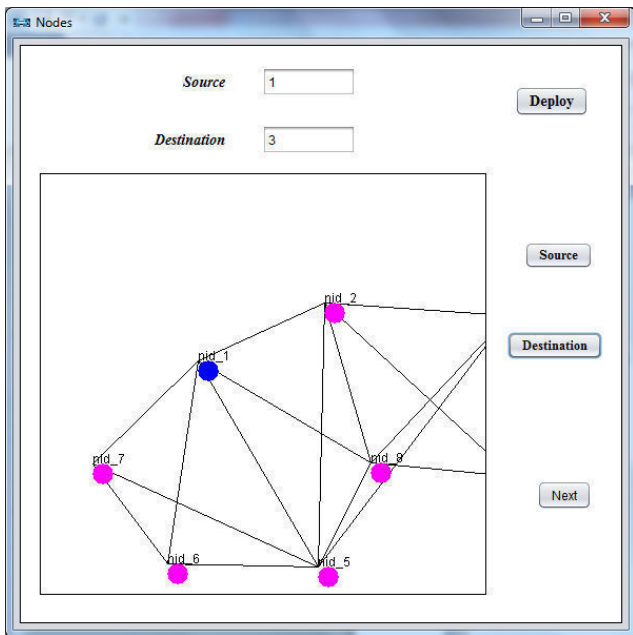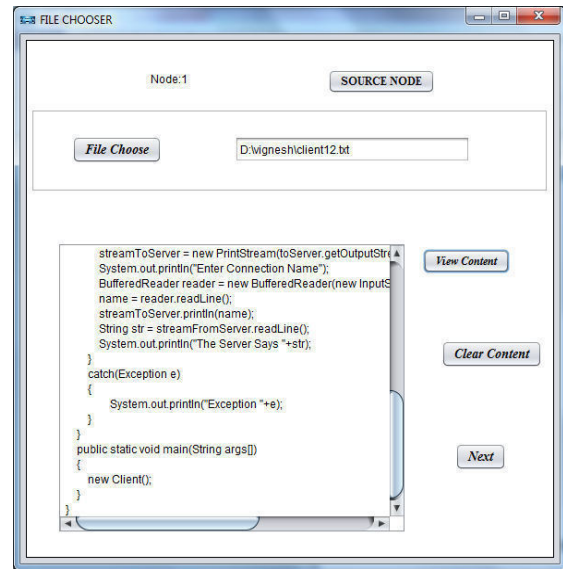
Figure 1.2: node module

Figure 1.4: file module

3.2.2 File module

In this module the user can select any files to choose for transmitting from selected source node to destination nodes using a particular path that can be calculated using a traffic engineering algorithm. Then the data can be verified and then the file splitter makes the file to split the data to transmit between nodes to source to destination. Then the verification can be done after the data reached the destination. Then the merging can be done after verification. All the file in the networks can be send only in packets in it.

Figure 1.3 File Module
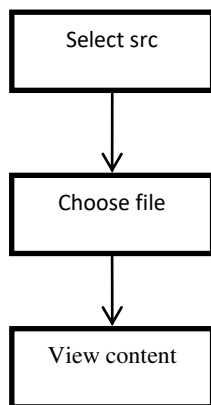
3.2.3 Forwarding module

In this module the path can be selected using a distributed algorithm to transmit a file from source to destination. To receive a file from one to another users. This module can be used as an intermediate to transmit files. Then the node verification can be done before transmitting the packets to the certain forwarding node to make the security process in the network. Then the data can be transmitted to the certain sequence at a certain frequency bandwidth in it.

Figure 1.5: forwarding module
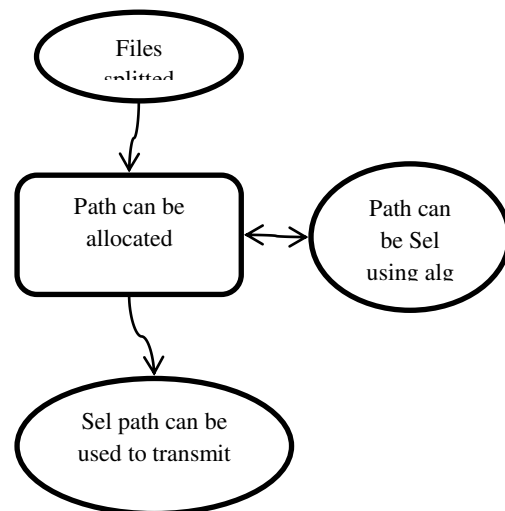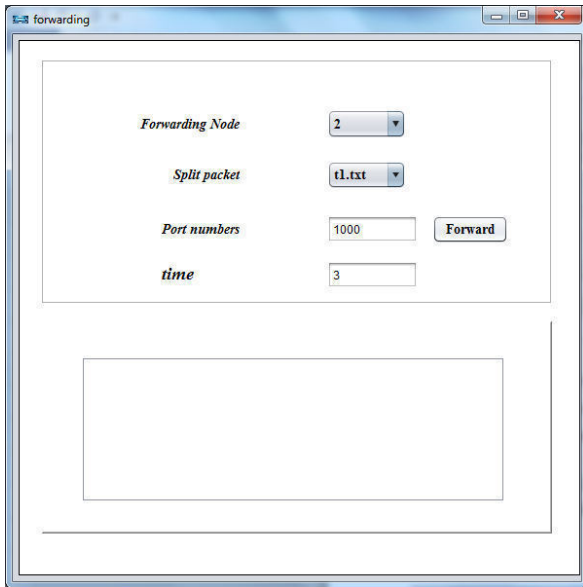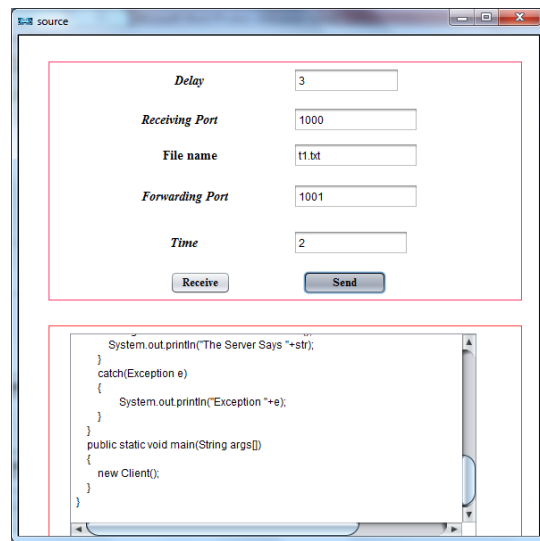
Figure1.6: forwarding module

Figure 1.8: distributed fault module

3.2.4. Distributed fault module

In this module the fault detection algorithm can be used to find the shortest path or routing path to transmit a file from one node to another node using an intermediate node or forwarding path and also used to calculate the delay for the process time. Then the algorithm makes the network to analysis the different path to make the transmission at a different path if any restrict happened during the transmission in the networks. Then the data can be transmitted during the prediction of the users.

Figure 1.7: distributed fault module

3.2.5 Fault module

In this module the fault of transmitting the files from source node to destination node of sensing nodes can be calculated using the distributed algorithm. Then the fault node and process time of the both averages can be calculated as a result data in it. Then the fault can be shown the node delay and the request and the response time of the node. Then the data can be process related to the calculation of node delay in it.
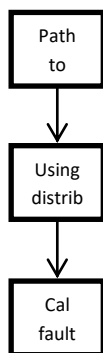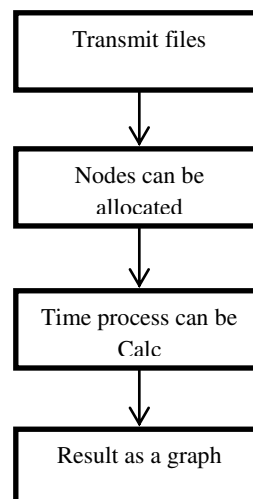
Figure 1.9: fault module
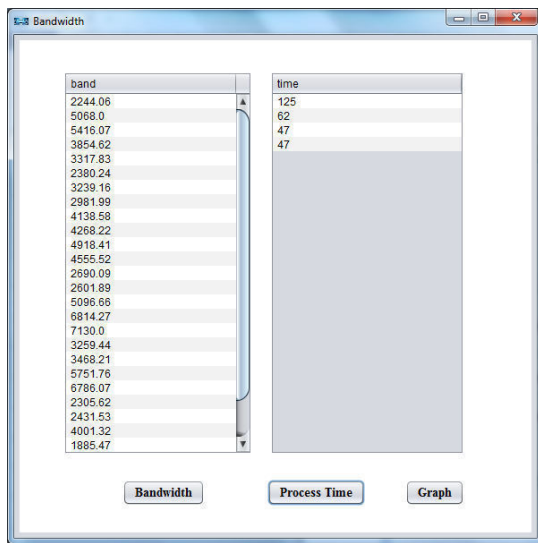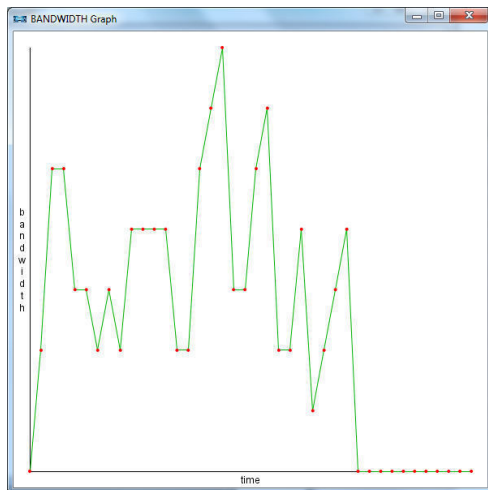
Figure 2.0: fault module

Figure 2.1 : fault module

IV. CONCLUSION

This paper proposes a self-detectable distributed fault detection algorithm to detect the faulty sensor nodes such as stuck at zero, stuck at one, stuck at nonzero and random fault in sensor networks. Here, each sensor node collects data from the neighbours and then diagnose itself by using the Neyman–Pearson test. The accuracy and completeness of the algorithm are analyzed by assuming the sensed data is noisy. The algorithm is implemented in NS3 and the performances are compared with the existing algorithms. From the simulation, it is evident that the algorithm detects the faulty sensor nodes with more than 98% detection accuracy for a wide range of fault probabilities and maintain a negligible (at max 6%) false alarm rate. The comparison result shows that the proposed scheme significantly improves the performance parameters for large scale sparse sensor networks as compared to that of existing algorithms. In fact, there is an 8%improvement in detection accuracy and34% improvement in false alarm rate as compared to existing algorithms. The proposed distributed fault detection scheme is efficient in terms of time complexity, message complexity, network life time, detection latency, energy consumption, detection accuracy and false alarm rate.

V. ACKNOWLEDGMENT

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SECURE COMMUNICATION BY DATA ANALYSIS IN ONLINE TRANSACTIONS USING BIGDATA

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Abstract:

   Cloud Computing has been envisioned as the next generation architecture of IT Enterprise security system in real time applications. In contrast to traditional solutions, where the IT services are under proper physical, logical and personnel controls, Cloud Computing moves the application software and databases to the large data centers, where the management of the data and services may not be fully trustworthy the sender and receiver should sharing the message with secure and timely manner This interface integrates all existing banks and provides business solutions for both retail and corporate. Multi-bank system. With cloud computing and storage, users are able to access and to share resources offered by cloud service providers at a lower marginal cost. With cloud computing and storage services, data is not only stored in the cloud, but routinely shared among a large number of users in a group. In this project, propose improve secrecy performance of relay networks without the direct link between the source and destination, a privacy-preserving auditing scheme for shared data with large groups in the cloud and utilize Merkle hash tree with signature to compute verification information on shared data, so that the File transfer is a generic term for the act of transmitting files over a Wi-Fi like the Internet. There are numerous ways and protocols to transfer files over a network. Computers which provide a file transfer service are often called file servers. Depending on the client's perspective the data transfer is called uploading or downloading. File transfer for the enterprise now increasingly is done with Managed file transfer is able to audit the correctness of shared data but cannot reveal the identity of the signer on each block. Finally proposed auditing scheme is to perform efficient public auditing to protect both identity and data privacy in cloud environments.

Keywords—security, message, sharing, IP address

I. INTRODUCTION

1.1 Cloud Computing

Cloud computing is a computing paradigm, where a large pool of systems is connected in private or public networks, to provide dynamically scalable infrastructure for application, data and file storage. With the advent of this technology, the cost of computation, application hosting, content storage and delivery is reduced significantly. It is a practical approach to experience direct cost benefits, and it has the potential to transform a data center from a capital-intensive set up to a variable priced environment. The idea of cloud computing is based on a very fundamental principles of reusability of IT capabilities. The difference that cloud computing brings compared to traditional concepts of "grid computing", "distributed computing", "utility computing", or "autonomic computing" is to broaden horizons across organizational boundaries. Forrester [1] defines cloud computing as: "A pool of abstracted, highly scalable, and managed compute infrastructure capable of hosting end customer applications and billed by consumption". It is a technology that uses the internet and central remote servers to maintain data and applications and allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing data storage, processing and bandwidth. Cloud computing examples are Yahoo e-mail, Gmail, or Hotmail.
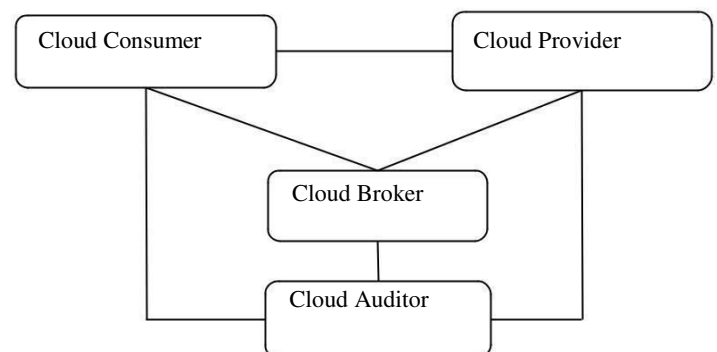

Figure 1.1 Architecture of cloud computing

1.2 Architecture

1.2.1 Cloud Provider

A person, organization, or entity responsible for making a service available to interested parties. A Cloud Provider acquires and manages the computing infrastructure required for providing the services, runs the cloud software that provides the services, and makes arrangement to deliver the cloud services to the Cloud Consumers through network access

1.2.1.1 Primary Cloud Provider

A Primary Provider offers services hosted on infrastructure that it owns. It may make these services available to Consumers through a third party (such as a Broker or Intermediary Provider), but the defining characteristic of a Primary Provider is that it does not source its service offerings from other Providers.

1.2.2 Cloud Consumer

"A person or organization that maintains a business relationship with, and uses service from, Cloud Providers. A cloud consumer browses the service catalog from a cloud provider, requests the appropriate service, sets up service contracts with the cloud provider, and uses the service. The cloud consumer may be billed for the service provisioned and needs to arrange payments accordingly."

What is not covered here is the **end user** that consumes the possibly enriched service offered by the Cloud Consumer. In SaaS, the Cloud Consumer is often identical with the end user. However, in business environments this is not always the case. Using the example of Gmail, only the paying entity is the Cloud Customer (e.g. IT department) while many other employees may use the mailing service as end users.

1.2.3 Cloud Auditor

A party that can conduct independent assessment of cloud services, information system operations, performance and security of the cloud implementation. A cloud auditor is a party that can perform an independent examination of cloud service controls with the intent to express an opinion thereon. Audits are performed to verify conformance to standards through review of objective evidence. A cloud auditor can evaluate the services provided by a cloud provider in terms of security controls, privacy impact, performance, etc.

1.2.4 Cloud Broker

"As cloud computing evolves, the integration of cloud services can be too complex for cloud consumers to manage. A cloud consumer may request cloud services from a cloud broker, instead of contacting a cloud provider directly. Hence the broker is an entity that manages the use, performance and delivery of cloud services, and negotiates relationships between Cloud Providers and Cloud Consumers." Brokers provide three different types of services to the Cloud Consumer.

II. EXISITNG SYSTEM

Wired communication refers to the transmission of data over a wire-based communication technology. Examples include telephone networks, cable television or internet access, and fiber-optic communication. Also waveguide (electromagnetism), used for high-power applications, is considered as wired line. Local telephone networks often form the basis for wired communications that are used by both residential and business customers in the area. Most of the networks today rely on the use of fiber-optic communication technology as a means of providing clear signaling for both inbound and outbound transmissions. Fiber optics are capable of accommodating far more signals than the older copper wiring used in generations

past, while still maintaining the integrity of the signal over longer distances

2.1. Mac Based Solution

It is used to authenticate the data. The user upload data blocks and MAC to CS provide its secret key SK to TPA [1]. The TPA will randomly retrieve data blocks & Mac uses secret key to check correctness of stored data on the cloud. Problems with this system are listed below as

➢ It introduces additional online burden to users due to limited use (i.e. Bounded usage) and stateful verification.
➢ Communication & computation complexity
➢ TPA requires knowledge of data blocks for verification
➢ Limitation on data files to be audited as secret keys are fixed
➢ After usages of all possible secret keys, the user has to download all the data to recomputed MAC & republish it on CS.
➢ TPA should maintain & update states for TPA which is very difficult
➢ It supports only for static data not for dynamic data.

2.2. Security Models for Bank Server

In existing system, the users need to log in to different online bank accounts to perform transactions. The process should be requiring many security issues. The net banking process can take more time. The online net banking process can allow to sending transactions only bank timings

2.3.1 Disadvantages

- Occur the traffic problem
- Retransmission problem is occurred
- Cost wise it is not feasible.
- It does not provide transactions from one bank to another bank.
- In this system separate account for each bank.
- To send transactions only within bank timings.

III. PROPOSED SYSTEM

3. Proposed System Architecture

3.1. Objectives:

In proposed system can introduced multibank system. These application users can save their time and use all features that are available in every bank. Transaction calculations and updating are maintained by admin and provide customer support for users. This system will act like a mediator between banks and users. Users can maintain single username and password and contact only one customer care service for any problems

The system model in this project involves three parties: the cloud server, a group of users and a public verifier. There are two types of users in a group: the original user and a number of group users. The original user initially creates shared data in the cloud and shares it with group users. Both the original user and group users are members of the group. Every member of the group is allowed to access and modify shared data. Shared data and its verification metadata (i.e. signatures) are both stored in the cloud server. A public verifier, such as a third-party auditor (TPA) providing expert data auditing services or a data user outside the group intending to utilize shared data, is able to publicly verify the integrity of shared data stored in the cloud server. When a public verifier wishes to check the integrity of shared data, it first sends an auditing challenge to the cloud server. After receiving the auditing challenge, the cloud server responds to the public verifier with an auditing proof of the possession of shared data. Then, this public verifier checks the correctness of the entire data by verifying the correctness of the auditing proof. Essentially, the

process of public auditing is a challenge and-response protocol between a public verifier and the cloud server.

Public Auditing A public verifier is able to publicly verify the integrity of shared data without retrieving the entire data from the cloud.

Correctness A public verifier is able to correctly verify shared data integrity.

Unforgettability Only a user in the group can generate valid verification metadata (i.e., signatures) on shared data.

Identity Privacy A public verifier cannot distinguish the identity of the signer on each block in shared data during the process of auditing. With cloud computing and storage, users are able to access and to share resources offered by cloud service providers at a lower marginal cost. It is routine for users to leverage cloud storage services to share data with others in a group, as data sharing becomes standard feature in most cloud storage offerings, including Dropbox, iCloud and Google Drive. The integrity of data in cloud storage, however, is subject to skepticism and scrutiny, as data stored in the cloud can easily be lost or corrupted due to the inevitable hardware/software failures and human errors. The traditional approach for checking data correctness is to retrieve the entire data from the cloud, and then verify data integrity by checking the correctness of signatures or hash values of the entire data. Certainly, this conventional approach able to successfully check the correctness of cloud data. However, the efficiency of using this traditional approach on cloud data is in doubt. The main reason is that the size of cloud data is large in general. Downloading the entire cloud data to verify data integrity will cost or even waste user's amounts of computation and communication resources, especially when data have been corrupted in the cloud. Recently, many mechanisms have been proposed to allow not only a data owner itself but also a public verifier to efficiently perform integrity checking without downloading the entire data from the cloud, which is referred to as public auditing. In these mechanisms, data is divided into many small blocks, where each block is independently signed by the owner; and a random combination of all the blocks instead of the whole data is retrieved during integrity checking. A public verifier could be a data user (e.g. researcher) who would like to utilize the owner's data via the cloud or a third-party auditor (TPA) who can provide expert integrity checking service and it can be described in fig 4.1.

3.2 Algorithm And Techniques:

- Linear Regression –

- Linear regression is one of the most basic algorithms of advanced analytics.

- Linear regression uses the relationship between two sets of continuous quantitative measures. The first set is called the predictor or independent variable

3.2.1 Binary Hash Tree (MHT)

To achieve privacy-preserving public auditing, propose to uniquely integrate the linear authenticator with binary tree technique. In our protocol, the linear combination of sampled blocks in the server's response is masked with randomness generated by the server. With random masking, the TPA no longer has all the necessary information to build up a correct group of linear equations and therefore cannot derive the user's

data content, no matter how many linear combinations of the same set of file blocks can be collected. On the other hand, the correctness validation of the block-authenticator pairs can still be carried out in a new way which will be shown shortly, even with the presence of the randomness. Our design makes use of a public key-based MHT, to equip the auditing protocol with public audit ability. An MHT Encryption scheme is comprised of a tuple of algorithms (Gen, E, D, Eval), and is defined with respect to a circuit C with t inputs. Though an MHT scheme can be either a public-key or symmetric-key system, we will define it as a public-key system here. The key generation algorithm Gen takes the security parameter 1^k as input, and outputs the public key and private key for the system (Notation: (pk, sk) ← Gen(1^k)).

- Assume that messages M ∈ {0, 1} $^{l(k)}$.
- The encryption algorithm E takes a public key and a message as input, and outputs a ciphertext C, (Notation: C ← E (pk, M) for M ∈ {0, 1} $^{l(k)}$).
- The decryption algorithm D takes a secret key and a ciphertext, and returns a message, (Notation: M ← D (sk, C) and M ∈ {0, 1} ^{l}).
- Finally, the evaluation algorithm Eval takes as input a public key, a description of a t-input circuit C, and t ciphertexts C1, . . ., Ct such that Ci← E (pk, Mi), and produces as output C*, (Notation: C* ← Eval (pk, C, C1, . . ., Ct)).
- We add a new correctness property to the standard correctness requirement for an encryption scheme as follows. We say that an encryption scheme is homomorphic with respect to a t-input circuit C if ∀k, ∀M1, . . ., Mt, Pr [(pk, sk) ← Gen(1k); C1, . . . Ct ← E (pk, M1), . . ., E (pk, Mt); C* ← Eval (pk, C, C1, . . ., Ct): D (sk, C*) = C (M1, . . . ,Mt)] = 1.
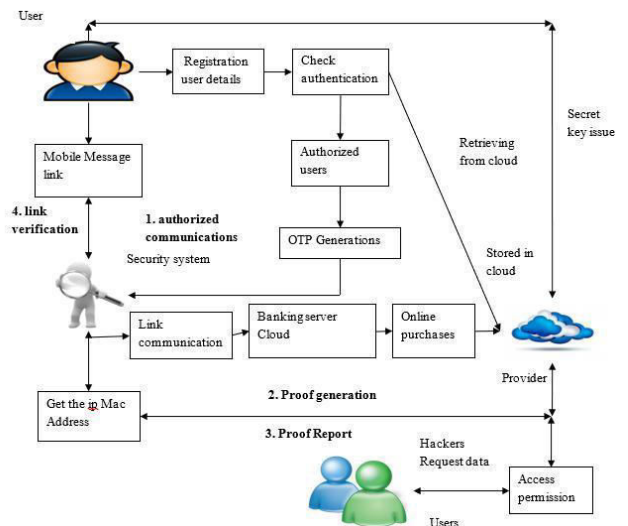
3.2. System Architecture

Similarly, a scheme with respect to a family of circuits {Ci} if the correctness property holds for any circuit C ∈ {Ci}. Note that so far, our definition makes no requirement that the output C* of Eval should look like a standard ciphertext. Indeed, without some additional restriction on C*, every standard encryption scheme (Gen, E, D) can be trivially modified to yield a homomorphic encryption scheme (Gen', E', D', Eval') with respect to all circuits as follows.

➢ Gen' runs as Gen.
➢ E' runs as E.
➢ The Eval' is constructed to take a public key, a circuit description, and up to t ciphertexts, and then output the circuit description concatenated with each of the ciphertexts, as C* ← Eval" (pk, C, C1,

., Ct) = C|C1| . . . |Ct, with | used to denote concatenation.

➢ On special cipher texts C* containing a circuit description, D' parses its input into C, C1, . . . ,Ct, runs the original decryption algorithm D on the ciphertexts to obtain messages Mi ← D(sk,Ci), and runs the circuit C on these messages, to obtain D'(sk,C*) = C(M1, . . . ,Mt), satisfying the

Homomorphic correctness property. Onciphertexts without circuit descriptions, D' (sk, C) simply returns D (sk, C).

3.3. Advantages Of The Proposed System:

✓ n" number nodes will construct MA (Monitoring Agents) network connection with Cloud Sites.

✓ There is no authorized memory utilized failure between internet because each Behavior data sites.

✓ The Dynamic routing path generation should provide the connection between Cloud Sites and receiver.

✓ It provides transactions from one bank to another bank.

✓ It provides Single account from all banks.

IV. MODULE DESIGN

4.1 Introduction

The proposed system provides improved public auditing scheme in decentralized manner and using outsourced POR approach to checks dynamic data modifications. Then it consists of five modules to complete the project successfully. Cloud framework is used to define the actors of the project and define their responsibilities. And keys are managed by public audit server and provide verification about integrity and check the dynamic operations in cloud storage systems. The auditing system is done by third party auditor. The full implementation is described in section 5.2.

4.2 List Of Modules

There are five modules of the project are enough to complete the project. The modules are listed below:

Login Web services

The user details are registered into the data base. The details are name, User Id, Information's and etc. The user can be entering the login process, verify the same details into the data base.

Change factor value

After the login process, then dynamically change the online payments value. If the password is once used. Then find out the IP track value. Thus, the hackers have to be stored into the data base at the login time.

Notification to the user

the Admin is every time verify the database. The data has to be modified then transmit to the correct user using mobile number. Checkout draft card details

Mobile banking

The Mobile banking is a service provided by a bank or other security instructions that allows its customers to conduct a range of transactions ID remotely using a mobile device such as a mobile phone. Improved for online System Environments.

Performance evolution

1. Cloud Framework
2. Key management
3. Data integrity
4. Dynamic auditing
5. Secure Data sharing

The detailed description of each module is described as follows:

4.2.1 Cloud Framework

Clouds are the hottest issue in the field of IT from a year now. Introduction of cloud computing has made a revolutionary change in the field of IT. Cloud computing is a most recent area which offers a different model for IT. Cloud computing is emerging technology which consists of existing techniques combined with new technology paradigms.

In this technology, shared different resources like software's, hardware's and information is provided to its users and other peoples on internet whenever demanded. Today's world relies on cloud computing to store different data such as their public as well as some personal information which is needed by the user itself or some other persons. Cloud service is any service offered to its users by cloud. As cloud computing comes in service there are some drawbacks such as privacy of user's data, security of user data is very important aspects. Cloud computing is demand on shared computing resources. With the continuous development of cloud computing technology, its appliance is more and more widely. Now a days, cloud computing is often used with different synonymous like grid computing, cluster computing, distributed computing, autonomic computing. Privacy is an important issue in cloud computing, whenever user wants to make use of data that involve individual sensitive information. With the rapid development of internet technology, privacy preserving data publication has become one of the most important research topics and become a serious concern in publication of personal data in recent years. However, for data owners who are becoming increasingly concerned about their privacy of the data which contains some personal information about individuals.

In this module, cloud data storage service three different entities such as the cloud user, who has large amount of data files to be stored in the cloud; the cloud server, which is managed by the cloud service provider to provide data storage service and has significant storage space and computation resources; the third-party auditor, who has expertise and capabilities that cloud users do not have and is trusted to assess the cloud storage service reliability on behalf of the user upon request.

4.2.2 Key management

Merkle hash tree contains three algorithms: Keygen, Sign and Verify. In Keygen, each user in the group generates his/her public key and private key. In Sign, a user in the group is able to generate a signature on a block and its block identifier with his/her private key and all the group members' public keys. A block identifier is a string that can distinguish the corresponding block from others. A verifier is able to check whether a given block is signed by a group member in Ring Verify.

MHT Encryption systems are used to perform operations on encrypted data without knowing the private key (without decryption), the client is the only holder of the secret key. When decrypt the result of any operation, it is the same as if had carried out the calculation on the raw data. A privacy preserving remote data integrity checking protocol with data dynamics and public verifiability make use of a Remote Data Integrity Checking Protocol. The protocol provides public verifiability without the help of a third-party auditor. It doesn't leak any privacy information to third party, which provides good performance without the support of the trusted third party and provides a method for independent arbitration of data retention contracts. But it gives unnecessary computation and communication cost.

The public auditing protocol: To achieve privacy-preserving public auditing, we propose to uniquely integrate the MHT with signature technique. In this protocol, the linear combination of sampled blocks in the server's response is masked with randomness generated by the server.

V. VERIFICATION AND VALIDATION
5.1 INTRODUCTION

In software project management, software testing, and software engineering, verification and validation (V&V) is the process of checking that a software system meets specifications and that it fulfills its intended purpose. It may also be referred to as software quality control. The testing activity is used to identify and fix errors. In this proposed system, some errors could be found. These errors are viewed and then analyzed using verification and validation process. After evaluating the errors, they are fixed.

Figure 5.1 Admin login page error

Fig 5.1 shows screenshot describing the syntax error in source code. This syntax error is subsequently resolved. The variable names are correctly defined with predefined syntax. Hence, the homepage is opened successfully without any error.
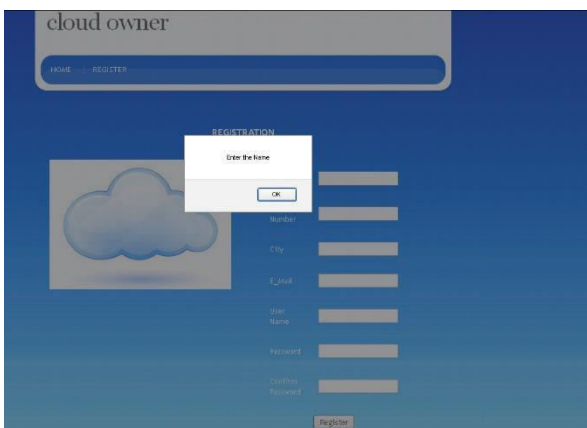

Figure 5.2 Cloud owner page error

Figure 5.2 shows validation screen at the time of registration. The validation is applied to each field. If the fields are empty means; message box is displayed. This validation error can be fixed. For example, if the name field

is empty means, message box is displayed with message as "Enter the name".

```
if (document. form1.un.value=="")
{
alert ("Enter the Username");
document. form1.un. focus ();
return false;
}
```


Figure 5.3 Access permission error

Fig 6.3 shows access permission error at the time of login the account. If the data owner does not get permission from cloud provider means, message is displayed as "Get access permission and then access your account". This validation can be fixed as error.

```
if($num==1)
{
$_SESSION['uname'] =$un; header ("location:
user.php");
}
else
{
$msg="You are getting access permission.
Then access your account!";
<script language="javascript">
```

VI. CONCLUSION

Cloud computing securities are discussed and analyzed in previous study. In this project, some of the privacy threats are addressed and the techniques to overcome them are surveyed. While some approaches utilized traditional cryptographic methods to achieve privacy, some other approaches kept them away and focused on alternate methodologies in achieving privacy. Also, approaches to preserve privacy at the time of public auditing are also discussed. Thus, to conclude it is necessary that every cloud user must be guaranteed that his data is stored, processed, accessed and audited in a secured manner at any time. Data freshness is essential to protect against mis configuration errors or rollbacks caused intentionally and can develop an authenticated file system that supports the migration of an enterprise-class distributed file system into the cloud efficiently, transparently and in a scalable manner. It's authenticated in the sense that enables an enterprise tenant to verify the freshness of retrieved data while performing the file system operations. The user must be given complete access control over the published data. Also, powerful security mechanisms must always supplement every cloud application. Attaining all these would end up in achieving the long-dreamt vision of secured Cloud Computing in the nearest future.

VII.ACKNOWLEDGMENT

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LIVE MIGRATION OF VIRTUAL MACHINE FOR CLOUD DATA CENTER

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Abstract— Cloud computing is on demand service as it offers dynamic, flexible and efficient resource allocation for reliable and guaranteed services in pay-as-you-use manner to the customers. In Cloud computing multiple cloud users can request number of cloud services simultaneously, so there must be a provision that all resources are made available to requesting user in efficient manner to satisfy their need without compromising on the performance of the resources. Cloud computing has its era and become a new age technology that has got huge importance and potentials in enterprises and markets. Clouds can make it possible to access applications and associated data from anywhere, anytime. One of the major challenges in cloud computing is related to optimizing the resources being allocated. The other challenges of resource allocation are meeting customer demands, data center management and application requirements. Here the design, implementation, and evaluation of a resource management system for cloud computing services are presented. System multiplexes virtual to physical resources adaptively based on the changing demand. Skewness metric is used to combine Virtual Machines with different resource characteristics appropriately so that the capacities of servers are well utilized. This algorithm achieves both overload avoidance and green computing for systems with multi resource constraints. Then we can implement the deduplication method which is a method of reducing storage needs by eliminating redundant data. This model is scalable enough to represent systems composed of thousands of resources and it makes possible to represent both physical and virtual resources exploiting cloud specific concepts such as the infrastructure elasticity.

Keywords— Virtual Machine, Skewness ,Allocation .Dynamic

I. INTRODUCTION

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. There are many types of public cloud computing

Cloud computing relies on sharing of resources to achieve coherence and economies of scale similar to a utility (like the electricity grid) over a network. At the foundation of cloud computing is the broader concept of converged infrastructure and shared services. Cloud computing providers offer their services according to three fundamental models: Infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS) where IaaS is the most basic and each higher model abstracts from the details of the lower

The thesis is organized as follows. The detailed discussion on various techniques on Cloud computing available in the literature related to the present research work is given in Chapter 1. Chapter 2 elaborates the module and the system architecture of phase

1. Work done in phase 2. elaborates the module and the system architecture are described in chapter 3. Implementation and results are described in chapter 4. Chapter 5 deals with the Screen shots of the system. Conclusion and future enhancement of the proposed approaches are described in Chapter 6. Conference and publication are explained in chapter.

II. EXISTING SYSTEM

2.1 Virtual resource allocation

Virtualization in cloud computing is a mechanism to abstract the hardware and the system resources from a

given operating system. This is typically performed within a cloud environment across a large set of servers using a Hypervisor or Virtual Machine Monitor (VMM) that lies in between the hardware and the Operating System (OS). In the static approach, the mapping of the VMs to physical infrastructure cannot be changed at runtime. A dynamic consolidation of VMs allows the reassignment of physical resources at runtime, when the load on the virtual machines increases or decreases. In case there is a low load on the VMs fewer physical resources need to be employed to provide certain performance level.

2..2 Cloud System

The cloud service provider is responsible for maintaining an agreed-on level of service and provisions resources accordingly. A CSP, who has significant resources and expertise in building and managing distributed cloud storage servers, owns and operates live Cloud Computing systems, it is the central entity of cloud.

Cloud provider activities for utilizing and allocating scarce resources within the limit of cloud environment so as to meet the needs of the cloud application. It requires the type and amount of resources needed by each application in order to complete a user job. The order and time of allocation of resources are also an input for an optimal resource allocation. Cloud consumer represents a person or organization that maintains a business relationship with, and uses the service from, a cloud provider. Users, who stores data in the cloud and rely on the cloud for data computation, Cloud consists of both individual consumers and organizations. Cloud consumers use Service-Level Agreements (SLAs) for specifying the technical performance requirements to be fulfilled by a cloud provider.

2.3 Virtual machine environment

Virtualization provides an efficient solution to the objectives of the cloud computing paradigm by facilitating creation of Virtual Machines (VMs) over the underlying physical servers, leading to improved resource utilization. Virtualization refers to creating a virtual version of a device or a resource such asa server, a storage device, network or even operating system where the mechanism divides the resource into one or more execution environments.

- When a physical server is considered to be overloaded requiring live migration of one or more VMs from the physical server under consideration.
- Selection of VMs that should be migrated from an overloaded physical server. VM selection policy (algorithm) has to be applied to carry out the selection process.
- Finding a new placement of the VMs selected for migration from the overload and physical servers and finding the best physical.

2.4 Deduplication implementation

Block deduplication looks within a file and saves unique iterations of each block. Each chunk of data is processed using a hash algorithm such as MD5 or SHA-1. This process generates a unique number for each piece which is then stored in an index. If a file is updated, only the changed data is saved. That is, if only a few bytes of a document or presentation are changed, only the changed blocks are saved; the changes don't constitute an entirely new file. This behavior makes block duplication far more efficient. However, block duplication takes more processing power and uses a much larger index to track the individual pieces. Hash collisions are a potential problem with duplication.When a piece of data receives a hash number, that number is then compared with the index of other existing hash numbers. If that hash number is already in the index, the piece of data is considered a duplicate and does not need to be stored again. Otherwise the new hash number is added to the index and the new data is stored. In rare cases, the hash algorithm may produce the same hash number for two different chunks of data. When a hash collision occurs, the system won't store the new data because it sees that its hash number already exists in the index. This is called a false positive and can result in data loss. Some vendors combine hash algorithms to reduce the possibility of a hash collision. Some vendors are also examining metadata to identify data and prevent collisions.

2.5 Performance evaluation

Dynamic VM consolidation consists of two basic processes: Migrating VMs from underutilized hosts to minimize the number of active hosts; and Offloading VMs from hosts when those become overloaded to avoid performance degradation as experienced by the VMs. The idle hosts automatically switch to a low-power mode to eliminate the static power and reduce the overall energy consumption by the system. Whenever required, the hosts are reactivated to accommodate new VMs or VMs being migrated. Another capability provided by virtualization is live migration, which is the ability to transfer a VM between physical servers (referred to as hosts, or nodes) with a close to zero downtime. Using live migration, VMs can be dynamically consolidated to leverage fine-grained fluctuations in the workload and keep the number of active physical servers

III. PROPOSED SYSTEM

Skewness Algorithm

A normal distribution is a bell-shaped distribution of data where the mean, median and mode all coincide. In a normal distribution, approximately 68% of the values lie within one standard deviation of the mean and approximately 95% of the data lies within two standard deviations of the mean. If there are extreme values towards the positive end of a distribution, the distribution is said to be positively skewed.

3 MODULES SPLITUP

3.1 Dynamic resource allocation

Resource Allocation (RA) is the process of assigning available resources to the needed cloud applications over the internet. Resource allocation starves services if the allocation is not managed accurately. Resource provisioning solves that problem by allowing the service providers to manage the resources for each individual module.
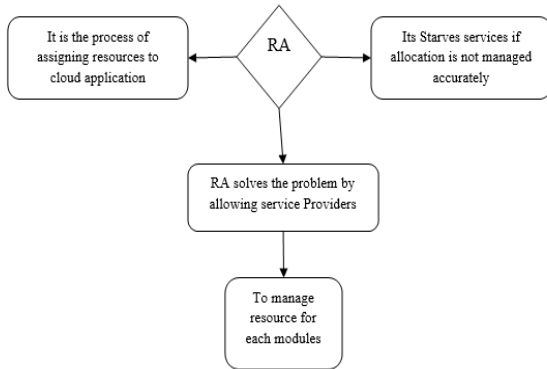
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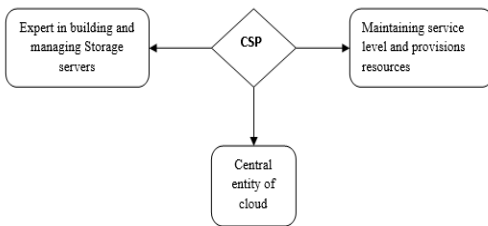

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Finding a new placement of the VMs selected for migration from the overload and physical servers and finding the best physical.

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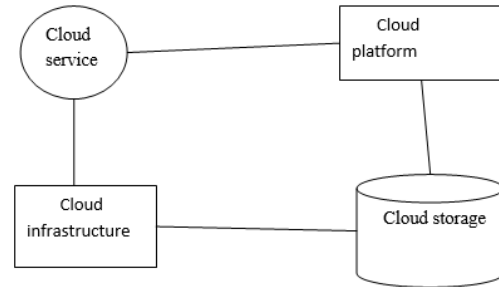

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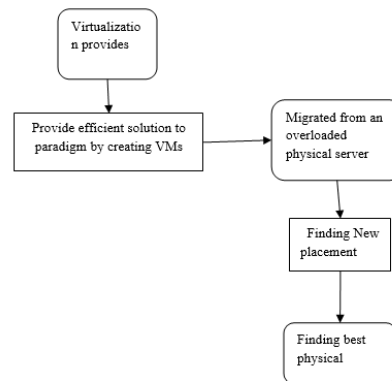
3.5 Resource manager

Service management (SM) in this context covers all the data center operations activities. This broad discipline considers the necessary techniques and tools for managing services by both cloud providers and the internal data center managers across these physical, IT and virtual environments. The availability of Service computing clouds gives researchers access to a large set of new resources for running complex scientific applications. However, exploiting cloud resources for large numbers of jobs requires significant effort and expertise.
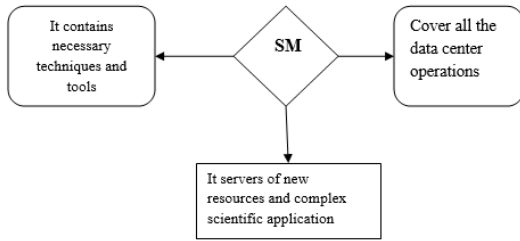
3.6 Performance evaluation

In cloud paradigm, an effective resource allocation strategy is required for achieving user satisfaction and maximizing the profit for cloud service providers. Some of the strategies discussed above mainly focus on CPU, memory resources .secured optimal resource allocation algorithm
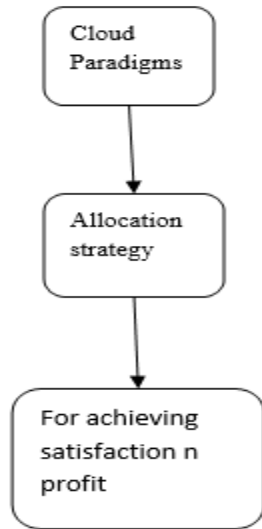
IV. CONCLUSION

In this paper, in a positively skewed distribution, the mean is greater than the mode. A negatively skewed distribution, on the other hand, has a mean which is less than the mode because of the presence of extreme values at the negative end of the distribution. Skewness is a measure of the asymmetry or unevenness of the probability distribution. A distribution may either be positively or negatively skewed. The concept of skewness is introduced to compute the unevenness in the utilization of multiple resources on a server.

FUTURE ENHANCEMENTS

Data deduplication (often called "intelligent compression" or "single-instance storage") is a method of reducing storage needs by eliminating redundant data. Only one unique instance of the data is actually retained on storage media, such as disk or tape. Redundant data is replaced with a pointer to the unique data copy. For example, a typical email system might contain 100 instances of the same one-megabyte (MB) file attachment. If the email platform is backed up or archived, all 100 instances are saved, requiring 100 MB storage space. With data deduplication, only one instance of the attachment is actually stored; each subsequent instance is just referenced back to the one saved copy. In this example, a 100 MB storage demand could be reduced to only one MB. Data deduplication offers other benefits. Lower storage space requirements will save money on disk expenditures. The more efficient use of disk space also allows for longer disk retention periods, which provides better recovery time objectives (RTO) for a longer time and reduces the need for tape backups. Data deduplication also reduces the data that must be sent across a WAN for remote backups, replication, and disaster recovery. Data deduplication can generally operate at the file or block level. File deduplication eliminates duplicate files (as in the example above), but this is not a very efficient means of deduplication.

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Efficient content delivery for Automated cloud Service – an Edge Data Models

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Abstract:

A Wireless communication system comprises of little estimated communication gadgets, which are outfitted with constrained battery power consuming and are adapted for remote exchanges. At the point when a WSN is sent in a sensing field, these sharing hubs will be in charge of sensing strange occasions or for gathered the sensed information of the world. On account of a communication hub distinguishing an irregular occasion or being set to occasionally report the sensed information, it will send the message jump by-bounce to an exceptional hub, called a sink hub. The sink hub will then illuminate the director through the Internet. In a WSN, communication hubs convey senser information once again to the sink through multi hopping. The communication hubs close to the sink will for the most part briefly on battery force than others; therefore, these hubs will rapidly empty out their battery validity and abbreviate the system lifetime of the WSN. A relocate sink is an modifying methodology for drawing out system lifetime by abstaining from staying at a certain area for a really long time which may hurt the lifetime of close-by communication hubs. In this paper, proposed an Energy-Aware Sink Relocation Method (EASR), which adopts the energy-aware way to finding MCP as the undergoing routing method for message relay. Experimentally analysis is given in this paper to display that EASR can extend the network lifetime of a WSN. Due to the battery resource constraint, it is a critical issue to save energy in wireless communication networks, commonly in large communication networks. One possible solution is to deploy multiple sink nodes simultaneously. In this paper, we propose a set of rules called MRMS (Multipath Routing in high scale communication networks with Multiple Sink nodes) which incorporates multiple sink nodes, a fresh path cost metric for improving path selection, altered cluster performance and way switching to improve energy efficiency and reliability . MRMS is shown to high the lifetime of communication elements substantially comparison to other algorithms based on a series of simulation experiments in communication in lifetime.

Keywords—Communication, Nodes, Networks, Ways.

I. INTRODUCTION

A wireless communication network (WSN) of spatially shared singles sensors to monitor physical or environmental conditions, such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location area . The more current networks are bi-directional, also enabling control of communication activity. The development of wireless communication networks was motivated by military requirements such as battlefield surveillance; now a days such networks are used in many industrial and consumer applications, such as industrial process monitoring and controlling , machine health monitoring, and so on.

A wireless communication network (WSN) consists of thousands to lacks of low-power multi-functional communication nodes, operating in an unattended environment, and having sensing, computation and communication capabilities. The basic components of a nodes are a communication unit, an ADC (Analog to Digital Converter), a CPU (Central processing unit), a power unit and communication unit. Communication nodes are micro-electro-mechanical systems (MEMS) that produce a measurable response to a change in some physical condition like temperature and pressure. Communication nodes sense or measuring physical data of the area to be monitored. The current analog signal sensed by the sensors is digitized by an analog-to-digital converter and sent to controllers for further processing. Communication nodes are of very small size, consume extremely low energy, are operated in high volumetric densities, and can be autonomous and adaptive to the environment. The spatial density of communication nodes in the field may be as high as 20 nodes/m3.As wireless communication nodes are typically very small electronic devices, they can only be equipments with a controlled power source.

Each communication node has a certain area of coverage for which it can reliably and accurately report the particular quantity that it is observing. Several sources of power consumption in sensors are: (a) signal sampling and conversion of physical signals to electrical (b) signal conditioning, and (c) analog-to-digital conversion.

II. EXISTING SYSTEM

Social Internet of Vehicles (SIoV) is a new diagram that enables social related among vehicles by integrating vehicle-to-everything sharing and social networking properties into vehicle environment. Through the provision of diverse socially-inspired applications and services, the emergence of SIoV helps to improve road experience, traffic efficiency, road safety, travel comfort, and entertainment along the roads. However, the computation performance for those applications has been seriously affected by resource-limited on-board units as well as deployment costs and workloads of road-side units. Under such context, an unmanned aerial vehicle (UAV) assisted mobile edge computing environment over SIoV with a three-layer integrated architecture is adopted in this paper. Within this system , we explore the energy-aware dynamic resource allocation problem by taking into account partial computation offloading, social content caching, and radio resource scheduling. Particularly, we develop an optimization architecture for total utility maximization by continually optimizing the transmit power of vehicle and the UAV trajectory.

In addition, under the condition of current power, a search algorithm is introduced to derive the optimized UAV trajectory based on acceptable ground-UAV distance metric and optimal offloaded data size of vehicle.

As a typical mobile Internet of Things, Internet of Vehicles (IoV) has emerged to provide ubiquitous information exchange and content sharing via its internal and external environment with little or no human intervention. With the help of On-Board Units (OBUs) installed on vehicles and Road-Side Units (RSUs) deployed along the sides of roads, together with benefits of the interaction of vehicle-to-everything techniques, IoV is highly characterized by gathering, sharing, processing, computing, and secure release of data services onto information platforms. Undoubtedly, IoV has become a promising way to realize the evolution from Intelligent Transportation System into intelligent vehicles, separate driving, electric vehicles , and Smart Cities . In addition, the widespread use of smart devices and the recent advances in next generation vehicles promote the inseparable relationships between smart devices and their human carriers.

It has become much more possible for drivers and passengers in IoV scenario to socialize and exchange information with other commuters in the context of temporal-spatial proximity on the roads. Thus, integration of advanced vehicle-to-everything communications and social networking properties into the IoV environment has emerged as a new paradigm of Social Internet of Vehicles (SIoV) . By enabling social interdependencies among vehicles, SIoV make drivers and passengers enjoy various socially-inspired applications which improve road experience, traffic efficiency, road safety, travel comfort, and entertainment along the roads. For instance, real-time traffic information with drivers' mutual interests, socially-aware interactive navigation, and same trip or route sharing with common preferences are the preferred services. In general, these attractive applications and services that hold massive content volume always require sustainable computation resources and constrained time delays. However, the vehicle-carried OBU often has low computation capability compared to core networking . Due to backhaul loading at high -hours, it is challenging for core networks to meet the latency requirements of these resource-hungry services. As a result, the tension between resource-limited vehicle-carried terminals and computation-intensive applications becomes the bottleneck for improvement of user satisfaction and quality of experience to socially-aware services in SIoV.

2.1. Optimal Power Allocation: Cooperation Case

Different from the noncooperation case as stated before, the cooperative behavior will also exist in the partial computation offloading. This results in the cooperation case where all the vehicles form a grand coalition through full cooperation for their common interests. Under this case, our objective is to maximize the sum of the utility functions of all the vehicles throughout the entire time slot while satisfying the evolution law constraint of energy consumption state for each vehicle. Hence, we present a dynamic optimization sub problem (P3) as follows to maximize the sum of the utility functions of all the vehicles.

III. PROPOSED SYSTEM

Recent advance in micro-electro mechanical system technology has made it possible to develop low-power and low-cost sensors with at a much reduced cost, so that large wireless communication networks with thousands of small sensors are well within the realm of reality.

In such wireless communication networks (WSN), sensors send data frames to sink nodes through multi-hop wireless links. As the shape of the network increases, the sensors near the sink nodes will dissipate energy faster than other sensors as they need to forward a larger number of messages, and prolonging the lifetime of whole network becomes a critical problem. One promising approach is to deploy multiple sink nodes in WSN, since it can low the energy consumption of sensors and improve the high scalability and reliability of the networks. .

3.1 . Objective of Purposed System

Distributed big data computing provide many storage to the user. Now a day the user level is highly increased to utilize the services in big data computing. In big data computing the major problem vicinity is fault tolerance. Mappings a major concern to guarantee availability and reliability of critical services as well as data transmission. In order to minimize failure impact on the system, failures should be anticipated and handle. Mapping techniques are used to predict these failures and take an appropriate action before or after failures occur. So we propose a mapping mechanism to detect and then recover from failures. Specifically, instead of simply using a query based configuration, we design a trust based method to detect failures in a fast way. Then, a checkpoint based algorithm is applied to perform data recovery. Our experiments shows that our method exhibits good performance and is proved to be efficient. And evaluate the performance of the system using latency and throughput parameters and visualized in distributed environments. Checking point is defined as a designated place in a program at which normal processing is interrupted specifically to preserve the status information necessary to allow resumption of processing at a later time. Review pointing is the process of saving the performance statues information.

3.2 Network formation.

Mobile ad hoc networks consist is a self organizing network. It consist of set of nodes. Each node move in any direction. Each and every node should have some kinds of ID, which is like N1, N2,…and Nn.

3.3 Multipath Routing with Multiple Sink nodes

MRMS (Multipath Routing in large scale communication networks with Multiple Sink nodes) which incorporates multiple sink nodes, a new path cost metric for improving path selection, dynamic cluster maintenance and path switching to improve energy efficiency Top Disc , which is derived from the simple greedy log (n)-approximation algorithm for finding the set cover.

At the end of the Top Disc topology discovery process, the communication network is divided into n clusters and each cluster is represented by one node, which is called the cluster head. To find the min path cost based on corresponding hop count. If the condition true means broadcast the new topology discovery request again otherwise Discard the arrangements discovery.

3.4 Resource Provisioning

We can evaluate the performance of the system using latency and throughput measurements. Latency is the delay from input into a system to desired outcome; the term is understood slightly differently in various contexts and latency issues also vary from one system to another. Latency greatly affects how usable and enjoyable electronic and mechanical devices as well as communications are. Latency in communication is demonstrated in live transmissions from various points on the earth as the communication hops between a ground transmitter and a satellite and from a satellite to a receiver each take time. Throughput is a measure of how many units of information a system can process in a given amount of time. It is applied broadly to systems
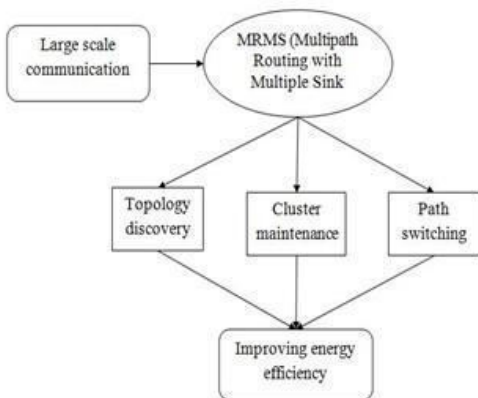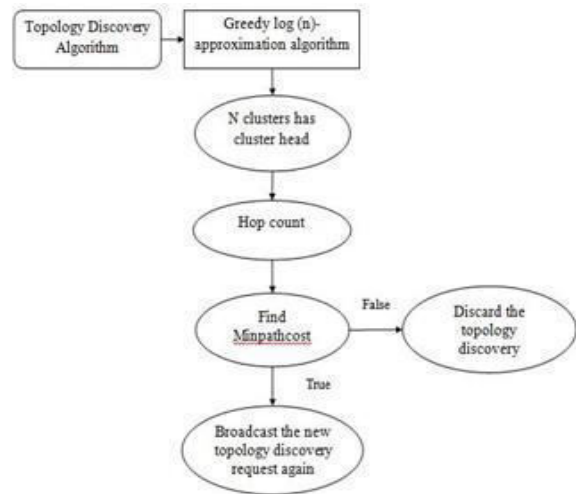

Figure 1.1 Network formation.

Figure 1.2 Multipath Routing

3.5 MRMS Grouping Maintenance

MRMS grouping maintenance includes two parts: energy monitoring and group reconstruction. Energy monitoring in MRMS is related to the straight-forward. A group header will check its energy sequencing.

If the sensor's residual energy is below some threshold, it will invoke the cluster reconstruction process. In group rearranged, when the residual energy of the cluster head (CH) is below some threshold, it will broadcast the SELECT_NEW_CH message to its neighbors. Any communication that receives this message will checks its routing table and reports its residual energy to the CH if the previous hop in its first path is the current CH.
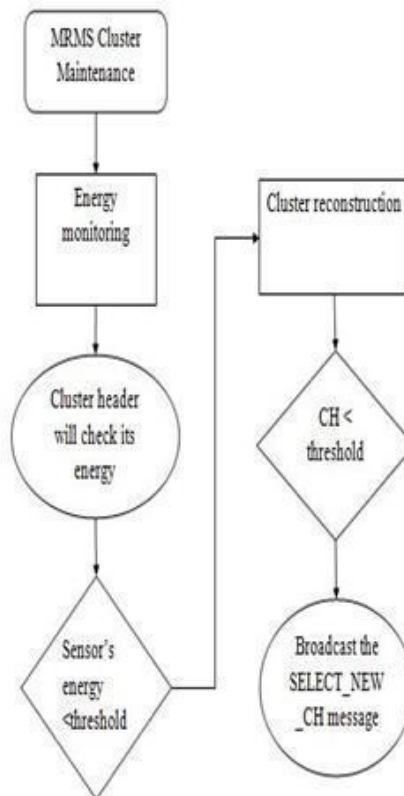

Figure 1.3 MRMS Grouping Maintenance

MRMS Path Switching

In MRMS, use an event-based approach where path switching is the process when during the grouping reconstruction process it is discovered that the current path is no longer the best path.

If the current path cost is larger than some threshold, the sink node will send fresh message to all communication nodes in this path , and if the current calculated path cost in the new sink is less than the path cost of the original primary path, then source CH will switch to the new sink node, otherwise simply return its later way cost to the CH.
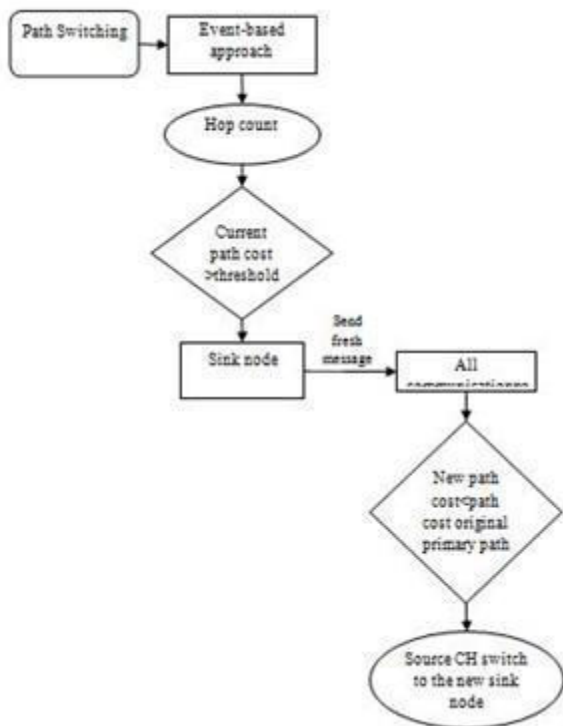

Figure 1.4 MRMS Path Switching

Ranging from various aspects of computer and network systems to organizations. Related measures of system productivity include also the speed with which some specific workload can be completed, and response time, the amount of time between a single interactive user request and receipt of the response. Our proposed system provides reduce number of latency and large throughput comparison to existing system and high communication with scalability and reliability.
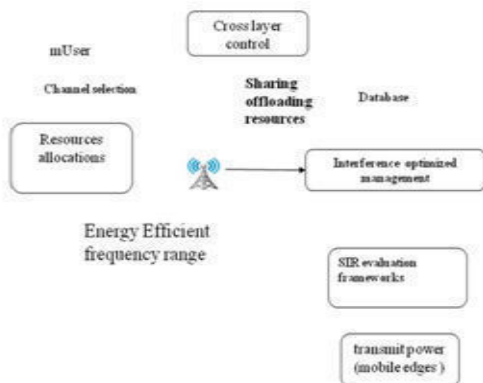

Fig:1.4 System Architecture

IV. CONCLUSION

In this paper, we provide a brief introduction of the Map Reduce technique. In this paper, proposed the MRMS algorithm which includes topology discovery, cluster maintenance and path switching. Since MRMS uses multiple sink nodes, cluster maintenance and path switching which can distribute the energy consumption in communication networks more evenly, it enjoys significant improvement in key metrics compared to other approaches.

V. FUTURE ENHANCEMENTS

To plan on exploring the effect of a loss MAC layer on the MRMS, as well as how to construct node-disjoint multi paths for multiple sink nodes.

Multipath routing protocols improve the load balancing and quality of service in WSN and also provide reliable communication. The multipath routing technique which has demonstrated its efficiency to improve wireless communication performance is efficiently used to find alternate paths between sources and sink.

VI. ACKNOWLEDGMENT

This is to acknowledgement that my paper prepared by myself and future enhancements will be implemented .Those are prove the scientific guidance, and Unpublished results.

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SMART PERSONAL SECURITY SYSTEM BASED ON FOOTWEAR USING MICROCONTROLLER

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Abstract:

Recently personal security has become a sensitive issue. Women's need to have their secure against harassments. Recent social incidents gave us motivation to develop personal security system. Women's mostly not able to fight against criminal for self-security. Today's world is full of rush and most of the women work independently to support their family. They have to work till late night. For such women, safety is the most important, so they have to come forward because of harassment. Best solution for those women is to carry a portable system using smart shoes. It will generate a shock to attack a lawbreaker, following that the message will be sent with the help of Global System for Mobile Communication (GSM) on the particular number with the location are stored of those women is traced with the help of Global Positioning System (GPS). If the message is not checked by the particular number mentioned, the system will continuously make a call until the message is checked.

Index term: GPS, GSM, smart shoes

I. INTRODUCTION

Women's work at different places like IT firms and so many places. After completion of their duty they have to go home late night so anything may happen at such timings as well as there is a chance of harassment at lonely places. For this purpose portable system is designed which can be easily carried with the women. Communication of alarming situation & prevention of incident has achieved by GPS, GSM technology and defensive system respectively. This is the aim of our system. As a result the design is separated into two parts. The message of the offense throughout wireless and prevention of the crime. Footwear is an irreplaceable part of human life across the globe.

In this shocking system with automation & alarm has been used. Pulse rate sensor, pressure & manual switches contribution has been considered for alarming, defensive situation and communication. The text message will be send to the added data based on people at destination for instant help to the user. User will have freedom to add or delete their need in disaster situation. University of Wisconsin-Madison engineering researchers Tom Krupenkin and J. Ashley Taylor have developed an in shoe system that harvests the energy generated by walking, but the energy is lost as heat, it claim up to 20 watts of electricity could be generated and stored in an incorporated rechargeable battery. It converts mechanical energy to electricity via a micro fluidic device. The process is said to have a power density of up to one kilowatt per square meter (10.76 sq. ft.), plus it works with a wide range of mechanical forces, and is able to output a wide range of currents and voltages. Throughout a conference proceedings. Margins, column widths, line spacing, and type styles are built-in; examples of the type styles are provided throughout this document and are identified in italic type, within parentheses, following the example. Some components, such as multi-leveled equations, graphics, and tables are not prescribed, although the various table text styles are provided. The formatter will need to create these components, incorporating the applicable criteria that follow.

A wireless sensor network (WSN) sometimes called a wireless sensor and actuator network (WSAN) are distributed autonomous sensors to monitor physical or environmental conditions as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location. The more modern networks are bi-directional, also enabling control of sensor activity. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance; today such networks are used in many industrial and consumer applications, such as industrial process monitoring and control, machine health monitoring, and so on. Location-based services (LBS) are a general class of computer program- level services that use location data to control features. As such LBS is an information service and has a number of uses in social networking today as an entertainment service, which is accessible with mobile devices through the mobile network and which uses information on the geographical position of the mobile device. This has become more and more important with the expansion of the smart phone and tablet markets as well. LBS are used in a variety of contexts, such as health, indoor object search, entertainment, work, personal life, etc. LBS is critical to many businesses as well as government organizations to drive real insight from data tied to a specific location where activities take place.

The spatial patterns that location-related data

Next five years, Smart system is the future of technology with so many different applications to it. We present in this project a system developed for a more convenient outdoor navigation. It involves the development of a power harnessing smart shoe to aid navigation and reduce the dependency of individuals on maps i.e. the need to constantly look at the maps for direction rather than focusing on the road.

II. RELATED WORK

Pantelopoulos, [1] attempts to comprehensively review the current research and development on wearable biosensor systems for health monitoring. An emphasis is given to multipara meter physiological sensing system designs, providing reliable vital signs measurements and incorporating real-time decision support for early detection of symptoms or context awareness. The aim of this work is not to criticize, but to serve as a reference for researchers and developers in this scientific area and to provide direction for future research improvements.

Bamberg, S.J.M. et al [2] describe a wireless wearable system that was developed to provide quantitative gait analysis outside the confines of the traditional motion laboratory. The sensor suite includes three orthogonal accelerometers, three orthogonal gyroscopes, four force sensors, two bidirectional bend sensors, two dynamic pressure sensors, as well as electric field height sensors. The "Gait Shoe" was built to be worn in any shoe, without interfering with gait and was designed to collect data unobtrusively.

Rocha, J.G et al [3] describes the use of piezoelectric polymers in order to harvest energy and services can provide is one on its most powerful and useful aspect where location is a common denominator in all of these activities and can be leveraged to better understand patterns and relationships. LBS include services to identify a location of a person or object, such as discovering the nearest banking cash machine or the whereabouts of a friend or employee. LBS include parcel tracking and vehicle tracking services. LBS can include mobile commerce when taking the form of coupons or advertising directed at customers based on their current location. They include personalized weather services and even location -based games. The Internet of Things (IoT) [4] and the world of Smart Systems are ushering in an era where people, machines, devices (e.g. sensors) and processes are all interconnected and able to interact seamlessly with one another. Business and IT leaders predict they will see an increase of more than one-third (33%) in revenues from the use of smart technologies over the from people walking and the fabrication of a shoe capable of generating and accumulating the energy. In this scope, electroactive polyvinylidene fluoride used as energy harvesting element was introduced into a bicolor sole prepared by injection, together with the electronics needed to increase energy transfer and storage efficiency. An electrostatic generator was also included in order to increase energy harvesting.

Oshin, O et al [4] uses the Arduino UNO microcontroller as the brain box of the designed system. The microcontroller was programed to achieve the various tasks needed in this project. The smart shoe is fitted with piezo-electric crystals which are pressure sensors generating the power required for the system, a Bluetooth module to interface with the mobile application which was programmed specifically for the shoe, and also vibrator motors which act as the output signal that is felt by the user to help inform them which way to turn. This work proffers solutions to the setbacks in navigation of the user with accuracy and focus.

Auti, M.S.S.et al [5] proposed the overall framework of the necessity as a safety monitor for Alzheimer's patients. Alzheimer's patient is a person having the difficulties about memory with the concepts of place & time. Global Positioning System (GPS) locator watches for patients are essentially RT-trackers that allow the family members or caregivers to have a complete access to whereabouts of person 24hrs. The GPS technology is placed inside a cavity made from a polycarbonate material which is in the midsole of the shoe. GTX says, the normal duration of the shoe - one to three years. The design of the system gives Energy efficiency, robustness, and reliability. Patient is having a mobile sensor unit which includes a GPS chip and antennas. Mobile sends latitude, longitude, and a time stamp. A GTX tracking map gives the latitude and longitude information on a geographical information system (GIS). The developed system can be used to track a specific area of patients. The main advantage of the system is a multilingual system. This means that we store the wav file in any language and play it back.

Maksood, F.Z et al [6] proposed descriptive details about the procedure, implementation, testing and results that were obtained. It also outlines the plans regarding the future plan and its potential release in the market. The design is microcontroller oriented and uses Arduino Uno and SIM900 GSM modem as its major components.

Goudar, V et al [7] propose a novel harvesting technology to in conspicuously transduce mechanical energy from human foot-strikes and explore its configuration and control towards optimized energy output. Dielectric Elastomers (DEs) are high-energy density, soft, rubber-like material that electrostatically transduce mechanical energy. These properties enables increased energy-transduction efficiency without sacrificing on user comfort, if configured and controlled properly. This work expose key statistical properties of human gait which show that an array of miniaturized harvester's across the foot-sole will improve energy output. Further, the gait properties naturally yield a closed-loop control strategy to individually control harvesters in the array in a manner that maximizes net energy output. This work propose statistical techniques that guide the configuration and control of the harvester array, and evaluate system behavior from detailed analytical and empirical models of DE behavior. System evaluations based on experimentally collected foot pressure datasets from multiple subjects show that the proposed system can achieve up to 120mJ per foot-strike, enough to power a variety of low-power wearable devices and systems.

Nabin Sapkota et al [8] investigate complex human socio economic infrastructure interactions and in-formation on past human adverse events (AE) in an active warth eater in order to predict future AE in a given geographical region. Human AE were defined as those security-related events that threatened human lives. Human socio economic infrastructure development data were derived by integrating three different datasets from different sources based on the United States Agency for International Development database. Using empirical data obtained from the country of Afghanistan from 2002 to 2010, we applied evolving self-organizing maps (ESOM) to forecast future patterns of such AE. Records from 2003–2009 were used as training data, while records from year 2010 were used to test the efficacy of ESOM in predicting AE. The socio economic data, dates, and geographical location information was used as input for the trained model. ESOM

algorithm with supervised learning was effective in understanding future patterns of AE in a war region. The results also showed the possibility of predicting future AE based on the in complete information pertaining to the geographical location, recent history of AE in the specific region of the country, and relevant socioeconomic infrastructure development data.

Zhao, J [9] et al describes a piezoelectric energy harvester for the parasitic mechanical energy in shoes originated from human motion. The harvester is based on a specially designed sandwich structure with a thin thickness, which makes it readily compatible with a shoe. Besides, consideration is given to both high performance and excellent durability. The harvester provides an average output power of 1 mW during a walk at a frequency of roughly 1 Hz. Furthermore, a direct current (DC) power supply is built through integrating the harvester with a power management circuit. The DC power supply is tested by driving a simulated wireless transmitter, which can be activated once every 2–3 steps with an active period lasting 5 ms and a mean power of 50 mW. This work demonstrates the feasibility of applying piezoelectric energy harvesters to power wearable sensors.

III. SYSTEM DESIGN AND IMPLEMENTATION

The system self-protection product has in build watch, mobile, and then other necessary devices. But these devices are only for safety alarm and intimate devices. These devices not uses for full self-production. Simply that device makes an alarm call, and message intimation in this system, to demonstrate a podiatric sensing shoe system that is powered completely by the movement of the wearer. Off-the-shelf electronics are used for energy harvesting capability, and to obtain distribution data of foot pressure. The proposed system is also vertically integrated, including not only the hardware, but also the coordinated visualization and database back-end. The system described in this paper combines novel energy harvesting techniques with force-based sensors to deliver an innovative solution to conventional in-lab equipment. The system is designed to be robust, mobile, and fully embedded in the patient's normal routine, allowing for podiatric analysis in a variety of environments. Due to the low- volume and low maintenance features, the device can be targeted for athletes, physical therapy patients, amputees, and those with muscular or nervous system disorders. There is no city or country in the world where women and girls live free of the fear of violence. No leader can claim: this is not happening in my backyard. Now we know that girls' safety is at prior importance in today's world. There is no such system which can provide the safety to girls and therefore the girl cannot move freely.

In this paper smart personal Security the shocking system with automation & alarm has been used for defense. The pressure sensor and manual switches contribution has been considered for alarming, defensive situation, as well as Communication.
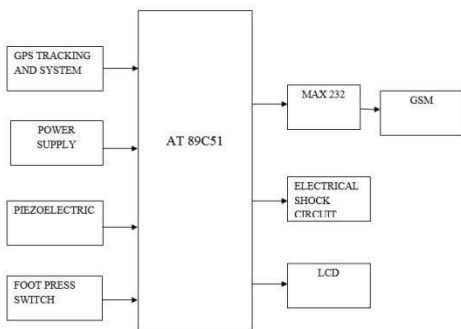

Fig 1 Block Diagram of Proposed Work

Fig 1 shows the overall structure of proposed work. The message will be send to the added data based people at destination for instant help to the user then will have freedom to add choice people's data base number Self-protection shoe At the first sight, the Electric shoe seems to be an (arguably) elegant pair of shoes, but they hide a very "shocking" secret: some amount of volts which the wearer can use in order to stun the possible aggressors. This shoe is used for self- protection and safety. If any problem for person means person just press the shoe that shoe produce a shock voltage. Suddenly that person stun that moment and person ran to anyplace Then again double time press mean send message to 5 person they are parents, police, closure relation, emergency rescue etc

A.   Power supply

The operation of power supply circuits built using filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage. The regulation is usually obtained from an IC voltage regulator unit, which takes a dc voltage and provides a somewhat lower dc voltage, which remains the same even if the input dc voltage varies, or the output load connected to the dc voltage changes.

B.   ATMEL89C51 MICROCONTROLLER

AT89C51 is an 8-bit microcontroller and belongs to Atmel's 8051 family. Fig 2 show overall architecture of microcontroller. ATMEL 89C51 has 4KB of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It can be erased and program to a maximum of 1000 times. In 40 pin AT89C51, there are four ports designated as P1, P2, P3 and P0. All these ports are 8-bit bi-directional ports.
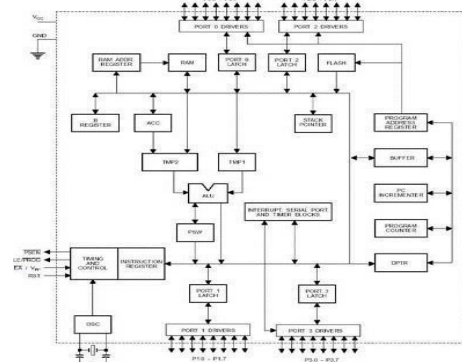

Fig 2 Architecture of ATMEL89C51

C.   PIEZOELCTRICITY

Piezoelectricity means electricity resulting from pressure. Fig 3 shows the clear working principles of piezo electric transducer. The piezoelectric effect is understood as the linear electromechanical interaction between the mechanical and the electrical state in crystalline materials with no inversion symmetry.
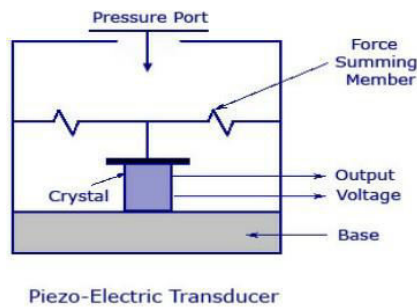
Fig 3 Piezo Electric Transducer

D. GSM

GSM refers to second-generation wireless telecommunications standard for digital cellular services. First deployed in Europe, it is based on TDMA (Time Division Multiple Access) technology.

GSM uses three frequency bands: 900 MHz, 1800 MHz and 1900 MHz Dual-band phones operate on two out of three of these frequencies, while tri- band phones operate on all three frequencies. GSM (Global System for Mobile Communications, originally Groupe Spécial Mobile), It is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe protocols for second generation (2G) digital cellular networks used by mobile phones. This was expanded over time to include data communications, first by circuit switched transport, then packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution or EGPRS).Further improvements were made when the 3GPP developed third generation (3G) UMTS standards followed by fourth generation (4G) LTE Advanced standards. "GSM" is a trademark owned by the GSM Association.

E. GPS

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The time, the message was transmitted to satellite position at time of message transmission Although four satellites are required for normal operation, fewer apply in special cases. If one variable is already known, a receiver can determine its position using only three satellites.

F. MAX 232:

The MAX232 is an integrated circuit, first created by Maxim Integrated Products, that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits. The newer MAX3232 is also backwards compatible, but operates at a broader voltage range, from 3 to 5.5 V.

G. LCD

A liquid crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. The LCD screen is more energy efficient and can be disposed of more safely than a CRT. Quartz has the further advantage that its elastic constants and its size change in such a way that the frequency dependence on temperature can be very low. The specific characteristics will depend on the mode of vibration and the angle at which the quartz is cut (relative to its crystallographic axes) Therefore, the resonant frequency of the plate, which depends on its size, will not change much, either. This means that a quartz clock, filter or oscillator will remain accurate.

H.EMBEDDED SYSTEMS PROGRAMMING

Embedded systems programming is different from developing applications on a desktop computers. Key characteristics of an embedded system, when compared to PCs, are as follows:
• Embedded devices have resource constraints(limited ROM, limited RAM, limited stack space, less processing power)
• Components used in embedded system and PCs are different; embedded systems typically uses smaller, less power consuming components.

Embedded systems are more tied to the hardware.

Two salient feature of Embedded Programming are code speed and code size. Code speed is governed by the processing power, timing constraints, whereas code size is governed by available program memory and use of programming language. Goal of embedded system programming is to get maximum features in minimum space and minimum time. Embedded systems are programmed using different type of languages:
•Machine Code
•Low level language, i.e., assembly
•High level language like C, C++, Java, Ada, etc.
•Application level language like Visual Basic, scripts, Access, etc.
•Use of C in embedded systems is driven by following advantages
•It is simpler to learn, understand, program and debug.
•C Compilers are available in all embedded devices and there is a large pool of experienced C programmers.
•Unlike assembly, C has advantage of processor-independence and is not specific to any particular microprocessor/ microcontroller or any system. This makes it convenient for a user to develop programs that can run on most of the systems.
•As C combines functionality of assembly language and features of high level languages, C is treated as a 'middle-level computer language' or 'high level assembly language'
•It is fairly efficient
•It supports access to I/O and provides ease of management of large embedded projects.
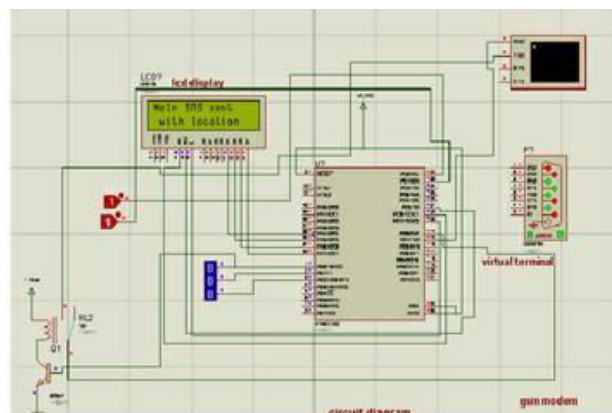
IV. EXPERIMENTAL RESULT

Fig 4 Circuit diagram of Proposed Work

Fig 4 shows simulation result, first the buzzer indicates shocking system, second buzzer indicates the message which send to the respected people that we have stored previously,

third buzzer indicates the sharing of location. They are programmed by c language and dump into the microcontroller, whereas port 2 is connected to the 16x2 LCD display to know which function is running. Input like analog signal is connected to the panic switch i.e. Buzzer. GSM is used in the virtual terminal. Virtual terminal is used for sending the message alert by the changes of 0 to 1, though which we can know the information in sending. Both the GSM and virtual terminal have TX and RX controller. They are connected to both the process as vice versa i.e. GSM's TX is connected to the virtual terminal's RX and virtual terminal's TX is connected to GSM's RX, so that only the information is transferred to virtual terminal. Then the output is viewed by the virtual terminal.

V. CONCLUSION

Supportive device with smart system has been used to cover self-attack .There are highest chances to reduce the crimes by this system. Shock preventive tools are used for anticipation of event, alarm bell hint with the help of this security system. Message through GPS & GSM technology is used to help the individual, for immediate action against the lawbreaker, in prospect acceptable process video information can be used. Fear or anger of women has to be considered by using Camera application in future which will generate the message to the control room and an alarm will activate. The system can perform the real time monitoring of desired area and detect the

violence with a good accuracy. Facial expression is one of the most realistic and immediate means for human beings to communicate their Emotions and intentions in future by using the mat lab application, can be consider for video information. The various facial behaviors and motions can be parameterized based on muscle actions. Multistate facial component have been develop to spot & track changes in facial reading. Those who are in unapproachable area for their defense against scandalous, atmospheric problems like earthquake, flood troubles, deep rainy spell and deep fog spell etc. Refuge system is the Supportive tool.

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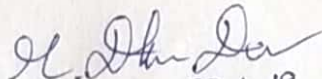### Siruganur, Tiruchirappalli – 621 105.

Department of Electrical & Electronics Engineering

3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years (10)

Academic Year 2018-2019

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication
1	Senthamarai Kannan A Ranjithkumar M	Load Shift Potential Analysis and Automatic Tripping using Various Demand Response			Recent Trends in Electrical Engineering	National	2018-2019
2	Senthamarai Kannan A	Load Shift Potential Analysis and Automatic Tripping using Various Demand Response			International Conference on Innovative Engineering Initiatives (ICIEI)	International	2018-2019

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Deemed to be University, Kumbakonam, TamilNadu on 5th April 2019, in the

title of...

LOAD SHIFT POTENTIAL ANALYSIS AND   AUTOMATIC TRIPPING USING VARIOUS DEMAND

RESPONSE

Dr. V. Dharmalingam
Prof & Head/ EEE/ SRC
Convenor

Dr. V. Ramaswamy
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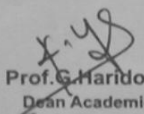
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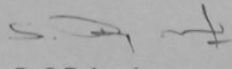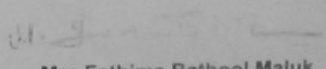
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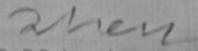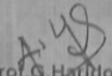### National Conference on Research & Recent Trends in Mechanical Sciences

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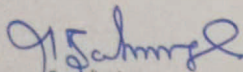
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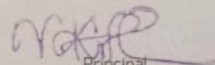Dean Admin

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Principal, NSCET.

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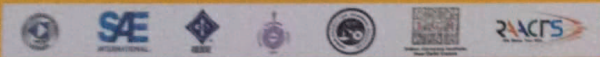Joint Secretary, NSCET.

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has participated / presented a paper on __INFLUENCE OF ALUMINA ON LM24 ALLOY COMPOSITE UNDER DRY SLIDING CONDITION__

in **Two Days INTERNATIONAL CONFERENCE (ICONNECT2K18)** organized at

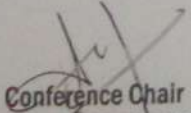K. Ramakrisnhan College of Technology, Trichy on **March 23rd & 24th 2018** .

COORDINATOR

PRINCIPAL

VINS CHRISTIAN
WOMEN'S COLLEGE OF ENGINEERING,
AB TECHNOLOGIES & TECH POWER SOLUTIONS JOINTLY ORGANIZING
INTERNATIONAL CONFERENCE ON
MODERN TRENDS IN ENGINEERING & RESEARCH
ICMTER-2018
DATE: 15th & 16th MARCH 2018.

Certificate

This is to certify that __Mr. T. ASHOK__ from

__M.A.M. SCHOOL OF ENGINEERING__ has presented a paper entitled

__ESPYING THE QUALITY OF WATER & ALERTING THROUGH__

__IoT__ in the International Conference on

Modern trends in Engineering & Research (ICMTER-2018) Organized by **Vins Christian**

Women's College of Engineering, Nagercoil during March 15 & 16, 2018.

Conference Chair
Dr. J. JEBA SONIA
Principal

Managing Director
K.S KAVIN
AB Technologies

Managing Director
A.CHANDRA SEKARAN
Tech Power Solutions

Nadar Saraswathi College of
Engineering & Technology

Theni Melapettai Hindu Nadargal Uravinmurai

NADAR SARASWATHI COLLEGE OF ENGINEERING & TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai
An ISO 9001 : 2015 Certified Institution
Annanji(po), Vadapudupatti, Theni - 625 531.

National Conference on

NEW SCIENTIFIC CREATIONS IN ENGINEERING AND TECHNOLOGY
NSCET -2K18

CERTIFICATE

This is to certify that Mr./Mrs./Ms./Dr. ....R.RAMANATHAN ASSOC.PROF

of ...M.A.M. SCHOOL OF ENGINEERING, TRICHY..... has participated /

Presented a paper titled ...RAPID PROTOTYPE OF AN ANIMAL

BONE REGENERATION USING 3D PRINTING TECHNOLOGY

in "National Conference on New Scientific Creations in Engineering and Technology"

organized by the Department of Mechanical Engineering on 16ᵗʰ March 2018.

Mr.M.Pradeep, M.E.,MISTE.,
Coordinator - Conference.
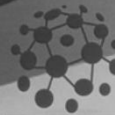
Mr.A.Boopathi, M.E.,MISTE.,
Convenor - Conference.

Mr.A.VembathuRajesh, M.E.,MISTE.,
HOD / MECH, NSCET.

Dr.C. Mathalai Sundaram, M.E., M.B.A., Ph.D., MISTE.,
Principal, NSCET.

Mr. K.S. Kasi Prabhu, B.Sc.,
Joint Secretary, NSCET.

CERTIFICATE

OF PRESENTATION

IFERP

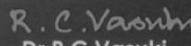connecting engineers...developing research

Since 1951

International Conference on
Recent Advancements in Information Technology, Science & Engineering
(ICRAITSE-17)

14th and 15th December 2017, Thoothukudi

This is to certify that .... **Ramanathan.R** ....

of .... M.A.M.School of Engineering .... presented his/her research

paper titled .... *Study, overview and implementation of MEMS based Micro factory for sustainable manufacturing*

system in 2020

.... during the International Conference on

"Recent Advancements in Information Technology, Science & Engineering (ICRAITSE-17)" held at A.P.C.Mahalaxmi College for

Women, Thoothukudi on 14th and 15th December 2017.

Mr.Rudra Bhanu Satpathy
Director
IFERP

R . C . Vasuki
Dr.R.C.Vasuki
Principal
APCMCW, Thoothukudi

Prof.V.Shyamala Susan
HOD of CS Dept.
APCMCW, Thoothukudi

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14th and 15th December 2017, Thoothukudi

This is to certify that .... **K.Chandrasekaran** .... presented his/her research

of .... M.A.M.School of Engineering ....

paper titled .... Fabrication and Optimization of MEMS based Micro Grinder ....

.... during the International Conference on

"Recent Advancements in Information Technology, Science & Engineering (ICRAITSE-17)" held at A.P.C.Mahalaxmi College for

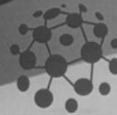Women, Thoothukudi on 14th and 15th December 2017.

Mr.Rudra Bhanu Satpathy
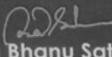Director
IFERP

CERTIFICATE

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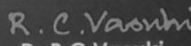connecting engineers...developing research

International Conference on
Recent Advancements in Information Technology, Science & Engineering
(ICRAITSE-17)

14th and 15th December 2017, Thoothukudi

This is to certify that .... **R.Ramanathan** ....

of .... M.A.M.School of Engineering .... presented his/her research

paper titled .... *Fabrication and Optimization of MEMS based Micro Grinder* ....

.... during the International Conference on

"Recent Advancements in Information Technology, Science & Engineering (ICRAITSE-17)" held at A.P.C.Mahalaxmi College for

Women, Thoothukudi on 14th and 15th December 2017.

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Director
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Dr.R.C.Vasuki
Principal
APCMCW, Thoothukudi

Prof.V.Shyamala Susan
HOD of CS Dept.
APCMCW, Thoothukudi

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This is to certify that .... **Chandrasekaran.K**

of .... M.A.M.School of Engineering

paper titled ....

system in 2020 .... Study, overview and implementation of MEMS based Micro factory for sustainable manufacturing .... presented his/her research

.... during the International Conference on

"Recent Advancements in Information Technology, Science & Engineering (ICRAITSE-17)" held at A.P.C.Mahalaxmi College for Women, Thoothukudi on 14th and 15th December 2017,

Mr.Rudra Bhanu Satpathy
Director
IFERP