

PONDICHERRY UNIVERSITY
(A Central University)

PONDICHERRY

EXECUTIVE SUMMARY OF FINAL REPORT OF THE WORK DONE ON THE PROJECT

01.	TITLE OF THE PROJECT	Simulation and development of security based Wireless Sensor Network using ZIGBEE module
02.	NAME AND ADDRESS OF THE PRINCIPAL INVESTIGATOR	Dr. P. Samundiswary Department of Electronics Engineering School of Engineering and Technology Pondicherry University Pondicherry-14
03.	NAME AND ADDRESS OF THE INSTITUTION	Department of Electronics Engineering School of Engineering and Technology Pondicherry University R.V. Nagar Kalapet Pondicherry-14
04.	UGC APPROVAL LETTER No. AND DATE	F.No.41-610/2012 (SR) dated 16.7.2012
05.	DATE OF IMPLEMENTATION	1.2.2013
06.	TENURE OF THE PROJECT	3Years
07.	TOTAL GRANT ALLOCATED	Rs.13, 58, 800/-
08.	TOTAL GRANT RECEIVED	Rs. 10, 34, 800/-
09.	FINAL EXPENDITURE	Rs. 10, 76, 800/-
10.	TITLE OF THE PROJECT	Simulation and development of security based Wireless Sensor Network using ZIGBEE module
11.	OBJECTIVES OF THE PROJECT	To analysis the performance of IEEE 802.15.4 (ZIGBEE) based WSN using security algorithm to mitigate the effect of attacks.
12.	WHETHER OBJECTIVES WERE ACHIEVED	ZIGBEE based WSN with security algorithm through simulation is developed. Further, the various performance metrics are examined.
13.	ACHIEVEMENTS FROM THE PROJECT	Prototype of Zigbee based WSN is developed . The performance of that model is analysed.
14.	SUMMARY OF THE FINDINGS (IN 500 WORDS)	In this project, the performance analysis of various routing protocols of Zigbee based WSN networks is done with and without wormhole attacks through

		simulation. Then, the security mechanism for IEEE 802.15.4 based WSN is developed to mitigate the effect of worm hole attack and their performance is evaluated. Further, the comparison is carried out between proposed security algorithm and existing method to verify the improvement in the performance of Zigbee networks using intrusion detection system. The real time performance analysis of Zigbee based WSN is also done.
15	CONTRIBUTION OF THE SOCIETY (GIVE DETAILS)	The developed secured Zigbee based WSN model can be used for green house and warehouse monitoring efficiently even in the presence of attackers because the security algorithm developed through this project will mitigate the effect of attackers
16.	WHETHER ANY PH.D ENROLLED/PRODUCED OUT OF THE PROJECT	Yes, Second Project Fellow appointed for this Project is enrolled as Ph. D candidate. He has been awarded Ph.D degree in the year 2018 (29.3. 2018).
17.	NO. OF PUBLICATIONS OUT OF THE PROJECT (PLEASE ATTACH)	<p>8 Papers have been published ;</p> <ol style="list-style-type: none"> 1. Jegan. G and Samundiswary. P, "Energy Efficient Intrusion Detection System for ZigBee based Wireless Sensor Networks", <i>International Journal of Intelligent Engineering and Systems (IJIES)</i>, vol.10, no.3, pp. 155-165, 2017, ISSN: 2185-3118. (Scopus Indexed) 2. G. Jegan and P. Samundiswary, "Wormhole Attack Detection in Zigbee Wireless Sensor Networks using Intrusion Detection System", <i>Indian Journal of Science and Technology</i>, vol.9, no.45, pp. 1-7, December 2016. ISSN (Print) : 0974-6846 (Scopus Indexed) 3. G. Jegan and P. Samundiswary , "Performance Evaluation of IEEE 802.15.4 based WSN using Routing Protocols under Wormhole Attacks", <i>International Journal of Applied Engineering Research</i>, vol.10, no.20, 2015. ISSN: 0973-4562.Impact Factor: 0.8 .(Scopus Indexed) 4. P. Samundiswary and G R K SaiTeja, "Performance Analysis of IEEE 82.15.4 based WSNs using Energy Efficient DYMO protocol", <i>International Journal of Advanced Research in Computer and Communication Engineering</i>, vol.3, n0.6, pp. 6871-6874, June 2014 ISSN (Print): 2319-5940.Impact Factor:1.770 5. P. Samundiswary and Dilip, "Performance Analysis of Energy Aware LAR protocol in IEEE 802.15.4 based Mobile Wireless Sensor Networks", <i>International Journal of Innovative Technology and Exploring Engineering</i>, vol.3, no.9, pp.92-98, February 2014, ISSN: 2278-3075.Impact Factor: 1.241. 6. Surender. R and P.Samundiswary, "Performance Analysis of IEEE 802.15.4 based Wireless Sensor Networks using LAR protocol for CBR and ZIGBEE Traffic Applications", <i>International Journal of Computer and Technology</i>, vol.10, no.9, pp. 1963-1968, September 2013, ISSN: 2277-3061. Impact Factor: 1.341.

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| | <p>7. P. Samundiswary and R. Surender, "Performance Comparison of GTS Mechanism enabled IEEE 802.15 based Wireless Sensor Networks using LAR and DYMO protocol", <i>Proceedings of IEEE sponsored International Conference on Electronics and Communication and Computational Engineering</i>, Hosur, TamilNadu, India 17th - 18th November 2014.</p> <p>8. K. Dilip and P. Samundiswary, " Performance Analysis of LAR protocol in Mobile Wireless Sensor Networks", <i>Proceedings of IEEE sponsored International Conference on Computer Communication and Informatics</i>, Coimbatore, TamilNadu, India, pp. 1-4, January 2014.</p> |
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(PRINCIPAL INVESTIGATOR)

(Mrs.) P. SAMUNDISWARY, M.Tech., Ph.D.
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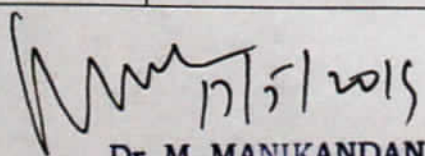
(REGISTRAR)

Registrar
Pondicherry University

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A: DETAILS OF PROJECT

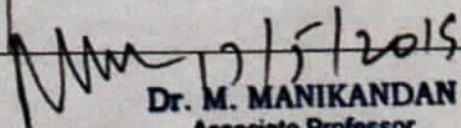
1.	UGC Reference No. and Date	F.No.41-610/2012 (SR) dated 16.7.2012		
2.	Name of the Principal Investigator	Dr. P. SAMUNDISWARY		
3.	Address with e-mail and mobile no.	Dr. P. Samundiswary Assistant Professor Department of Electronics Engineering School of Engineering and Technology Pondicherry University Pondicherry-14 Email: sam.dee@pondiuni.edu.in		
4.	Department and University/College where the project has undertaken	Electronics Engineering and Pondicherry University		
5.	Title of the Project	"Simulation and development of security based Wireless Sensor Network using ZIGBEE module"		
6.	Date of Implementation	1.2.2013		
7.	Tenure of the Project	3Years		
8.	Name of the Project Fellow and date of Appointment	S.No	Name of the Project Fellow	Joining Date
		1	Mr. R. Surender	26.2.2013 and resigned in January 2014
		2	Mr. G. Jegan	10.6.2014
9.	Grant Received	Total Grant Allocation: Rs.13, 58,800/- 1 st Installment: Rs. 10, 34,800/- (No money was received thereafter)		
10.	Project Status	Completed		



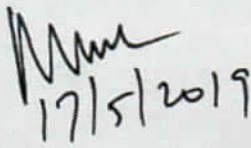
Dr. M. MANIKANDAN
Associate Professor
Department of Electronics Engineering
MIT Campus, Anna University
Chrompet, Chennai - 600 044.

B: EVALUATION REPORT OF EXPERT MEMBERS

1.	Name of the Principal Investigator	Dr. P. SAMUNDISWARY
2.	Designation	Assistant Professor
3.	Address of Principal Investigator	Department of Electronics Engineering School of Engineering and Technology Pondicherry University Pondicherry-14
4.	Whether work is focused on the title of sanctioned project	Yes
5.	Whether original work is done	Yes
6.	Whether significant contribution made by Principal Investigator	Yes
7.	Whether proposed work have relevance to the Society/Scientific Community	Yes ; It is related to Engineering having relevance in social community
8.	What type of contribution found in the final report: Theoretical/Practical? If there are theoretical contributions given by Principal Investigator ,Whether applications are considered	Both Software and Hardware implementation are done
9.	Whether theoretical contributions and their results and findings are published	Yes
10.	Whether results and findings are significant	Yes
11.	Whether the significant publications are made by Principal Investigators in Peer reviewed journals	Yes
12.	The number of publications made by Principal Investigator in Standard reputed journal	3
13.	Whether contributions made by investigator is sufficient	sufficient


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14.	The findings and results of the sanctioned projects are justifiable	Very much justifiable
15.	Whether completed project work meet the proposed objectives	Yes
16.	Give your brief comments on the overall work of the project	The security algorithm for IEEE 802.15.4 based WSN has been developed by PI to mitigate the effect of worm hole attack and their performance is evaluated. Then, the performance comparison is done between proposed security algorithm and existing security system to verify the enhancement of performance of Zigbee networks using newly developed security algorithm
17	Any specific comments	Performance evaluation and comparison is done
18	Indicate your overall assessment of the project : Poor/Good/Excellent	Good
	Name: Address of Expert: Dr. M. MANIKANDAN Associate Professor Department of Electronics Engineering MIT Campus, Anna University Chrompet, Chennai - 600 044. Date: Place:	Signature:  17/5/2019



PRINCIPAL INVESTIGATOR

Dr. (Mrs.) P. SAMUNDISWARY, M.Tech., Ph.D.

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2.	Name of the Principal Investigator	Dr. P. SAMUNDISWARY		
3.	Address with e-mail and mobile no.	Dr. P. Samundiswary Assistant Professor Department of Electronics Engineering School of Engineering and Technology Pondicherry University Pondicherry-14 Email: sam.dee@pondiuni.edu.in		
4.	Department and University/College where the project has undertaken	Electronics Engineering and Pondicherry University		
5.	Title of the Project	"Simulation and development of security based Wireless Sensor Network using ZIGBEE module"		
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		1	Mr. R. Surender	26.2.2013 and resigned in January 2014
		2	Mr. G. Jegan	10.6.2014
9.	Grant Received	Total Grant Allocation: Rs.13, 58,800/- 1 st Installment: Rs. 10, 34,800/- (No money was received thereafter)		
10.	Project Status	Completed		

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Dr. S. NARAYANA REDDY
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 Department of E. C. E.
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B: EVALUATION REPORT OF EXPERT MEMBERS

1.	Name of the Principal Investigator	Dr. P. SAMUNDISWARY
2.	Designation	Assistant Professor
3.	Address of Principal Investigator	Department of Electronics Engineering School of Engineering and Technology Pondicherry University Pondicherry-14
4.	Whether work is focused on the title of sanctioned project	Yes
5.	Whether original work is done	Yes (Original)
6.	Whether significant contribution made by Principal Investigator	Yes
7.	Whether proposed work have relevance to the Society/Scientific Community	Yes
8.	What type of contribution found in the final report: Theoretical/Practical? If there are theoretical contributions given by Principal Investigator ,Whether applications are considered	Both (Theoretical and Practical)
9.	Whether theoretical contributions and their results and findings are published	Yes
10.	Whether results and findings are significant	Yes(Significant)
11.	Whether the significant publications are made by Principal Investigators in Peer reviewed journals	Yes
12.	The number of publications made by Principal Investigator in Standard reputed journal	6 Journal papers and 2 IEEE Conference papers
13.	Whether contributions made by investigator is sufficient	Yes, Sufficient

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14.	The findings and results of the sanctioned projects are justifiable	Yes
15.	Whether completed project work meet the proposed objectives	Yes
16.	Give your brief comments on the overall work of the project	Performance of the various routing protocols of Zigbee based WSN networks such as AODV, DYMO, OLSR, ZRP and LAR has been examined through simulation. Security for IEEE 802.15.4 based WSN has been proposed to mitigate the effect of worm hole attack and their performance is evaluated. Comparison is carried out between proposed security algorithm and existing Trust system and real time performance analysis of Xbee S2 enabled WSN is also done.
17	Any specific comments	As wireless technology area using growing at rapid rate, further work can be carried for real time data applications.
18	Indicate your overall assessment of the project : Poor/Good/Excellent	Excellent
	Name: Address of Expert: Prof S Narayana Reddy, Dept. of ECE Chairman-PG Board of Studies(ECE) S.V.University, Tirupati-517502 Date:4-6-2019 Place:Tirupati	Signature:  Dr. S. NARAYANA REDDY Professor & Chairman, Board of Studies Department of E. C. E. S. V. U. College of Engineering Sri Venkateswara University TIRUPATI - 517 502, A.P., INDIA.



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