

Vishal Kumar Arora

Department of CSE
SBS State Technical Campus
Ferozepur-152004
Punjab, India

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Ferozepur City-152002
Punjab, India
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PARTICULARS

EDUCATION

Ph.D in Computer Science and Engineering ,
I.K.G. Punjab Technical University, Kapurthala, Punjab, India

M.Tech in Computer Science and Engineering, April 2011
DAV Institute of Engineering and Technology, Jalandhar, Punjab, India
I.K.G. Punjab Technical University, Kapurthala, Punjab, India

B.Tech in Computer Science and Engineering, June 2002
Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India
I.K.G. Punjab Technical University, Kapurthala, Punjab, India

RESEARCH INTERESTS

My research interests span the areas of wireless sensor network, network security. I have a specific interest in algorithms for increasing the network lifetime of wireless sensor network, Malware detection, IoTs and software defined networking.

DISSERTATION

- **Doctorate of Philosophy (Ph.D.)**

Title: On Network Life Span based Assessment For Improved Wireless Networks

Advisor: Dr Vishal Sharma, Dr. Monika Sachdeva

In this thesis, a meta-heuristic based energy-efficient routing algorithms that handle power-limitation issue of the sensor nodes intelligently to prolong the network life of wireless networks has been proposed. This research work investigated non-beacon mode adopted by various topologies of 802.15.4/ZigBee based WSN network. The observations depict that the MAC delay increases for all the reported scenarios as network load increases due to the increase in local collisions and overall congestion. On scrutinizing the obtained observations extensively, the author found that cluster-tree outperform other topologies in terms of throughput, network load, BER, received power, and SNR at the cost of End-to-End delay. Further, to ascertain an energy efficient route among the available routes to arrive at BS, the authors proposed a multi-criteria routing approach that selects parent nodes among the neighbor nodes not only on the basis of communication distance between sensor node and the BS but also by computing the residual energy level, the energy required to transmit the data to the BS, and the number of associated child nodes. This leads to a uniform energy utilization of each sensor node and achieved a significant improvement of network lifespan by 20-30% in contrast to its existing counterpart. The authors further extend the work by demonstrating an energy-efficient multiple pheromone-based ant colony optimization scheme. The proposed work considers the residual energy, node density, and distance among the sensor nodes to discover the most efficient route to the BS with less node-energy utilization that leads to high network life span.

- **Master of Technology (M.Tech.)**

Title: Signature Based Dynamic Blocking of Malware

Advisor: Mr Parveen Kakkar, Dr. Krishan Kumar

Based on the open source and freely available software's, we developed a Network-Intrusion Detection Prevention System (N-IDPS), a customized solution that monitors all network traffic entering into network, updates new rules/signatures, customizes the rule set as per the network to drop the traffic in real time. Initially, all the available rules were placed to monitor the incoming traffic. After analysing the incoming traffic, N-IDPS tune the rule set as per the deployed network and keep on updating the relevant signatures to reduce the number of comparison and to limit the size of database. Moreover, N-IDPS prevent the malicious traffic from entering the network.

TEACHING EXPERIENCE

- *Adesh Institute of Engineering and Technology, Faridkot, Punjab, India*
Lecturer, CSE Department July 2005 – July 2006
- *Beant College of Engineering and Technology, Gurdaspur, Punjab, India*
Lecturer, IT Department July 2006 – December 2008
- *Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India*
Assistant Professor, CSE Department December 2008-till date

IMPORTANT ADMINISTRATIVE RESPONSIBILITIES

- Coordinator Academics of CSE department since August 2016 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
- Coordinator, Punjab Government program EDUSAT from September 2009 to March 2012 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
- Appointed as Observer for May-2011 end semester examination at North West Institute of Engineering and Technology, Moga, Punjab, India.
- NBA Co-coordinator of CSE department since June 2016 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
- In-charge of Major Project and Software Engineering lab of CSE department since March 2009 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
- Accounts Officer of CSE department at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
- In-charge extra co-curricular activity of CSE department from 2009 to 2014 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
- In-charge of Right to Information Act (2005) at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
- Floor In-charge of CSE department at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.

RESEARCH CREDENTIALS

ResearchGate (RG) score - 8.05

ORCID id: <https://orcid.org/0000-0002-0331-1053>

Google Scholar: Total citations as on date 108, h-index =4 and i-index = 1

JOURNAL PAPERS

1. Vishal Kumar Arora, Vishal Sharma, Monika Sachdeva "A Multiple Pheromone Ant Colony Optimization Scheme for Energy Efficient Wireless Sensor Networks", *Soft Computing, Springer*, 2019. (**Impact Factor- 2.8**, ISSN: 1433-7479)

2. Vishal Kumar Arora, Vishal Sharma, Monika Sachdeva "A Distributed, Multi-Hop, Adaptive, Tree-based Energy-Balance Routing Approach", *International Journal of Communication Systems*, Wiley, 2019. (**Impact Factor- 1.2**, ISSN: 1099-1131)
3. Vishal Kumar Arora, Vishal Sharma, Monika Sachdeva "ACO Optimized Self-Organized Tree-Based Energy Balance Algorithm for Wireless Sensor Network", *Journal of Ambient Intelligence and Humanized Computing*, Springer, 2019. (**Impact Factor-1.9**, ISSN: 1868-5145)
4. Dolly, Vishal Kumar Arora, Richa Sawhney "Tree-Based Energy Efficient Clustered Routing Strategy for Wireless Sensor Networks", *International Journal of Computer Applications*, Volume 180, Issue 25, Pages 32-36, 2018.
5. Navpreet Kaur, Vishal Kumar Arora, Richa Sawhney "Energy based Self-Organizing Tree-based Routing Strategy for Wireless Sensor Networks", *International Journal of Computer Applications*, Volume 180, Issue 25, Pages 42-47, 2018.
6. Vishal Kumar Arora, Vishal Sharma, Monika Sachdeva "On QoS evaluation for ZigBee incorporated Wireless Sensor Network (IEEE 802.15.4) using mobile sensor nodes", *Journal of King Saud University-Computer and Information Sciences*, Elsevier, 2018. (ISSN: 1319-1578)
7. Vishal Kumar Arora, Vishal Sharma, Monika Sachdeva "A survey on LEACH and other's routing protocols in wireless sensor network", *International Journal for Light and Electron Optics*, Elsevier, 2016. (**Impact Factor-1.91**, ISSN: 0030-4026)
8. Gurpreet Kaur, Vishal Kumar Arora "Enhancement of Network Lifetime Using Improved MOD-LEACH In WSN", *International Journal of computer and distributed systems*, Volume 1, Issue 4, Pages 118-123, 2016.
9. Shikha Chabra, Vishal Kumar Arora "A Review of General Self-Organized Tree-Based Energy-Balance Routing Protocol For Wireless Sensor Network", *INTERNATIONAL JOURNAL OF COMPUTERS & TECHNOLOGY*, Volume 16, Issue 2, Pages 7591-7596, 2016.
10. Kulvir Singh, Sunny Behal, Vishal Kumar Arora "An Improvement of Network Life Time using DLQAR Protocol in Wireless Sensor Network", *International Journal of Computer Applications*, Volume 119, Issue 21, Pages 28-32, 2015.
11. Kashish Monga, Vishal Kumar Arora "Refinement of WPA using SHA3", *International Journal of Engineering Sciences & Research Technology*, Volume 4, Issue 12, Pages 492-497, 2015.
12. Harpreet Singh, Vishal Kumar Arora "An Optimized Parallel Schedule For Rigid Based Job Allocation Structure", *International journal of advanced technology in engineering and science*, Volume 3, Issue 1, Pages 222-233, 2015.
13. Gurpreet Kaur, Vishal Kumar Arora "A MODIFIED LEACH ALGORITHM USING HARD AND SOFT THRESHOLD IN WIRELESS SENSOR NETWORK: A REVIEW", *INTERNATIONAL JOURNAL OF COMPUTERS & TECHNOLOGY*, Volume 14, Issue 10, Pages 612-6146, 2015.
14. Navdeep Kaur, Vishal Kumar Arora "Optimum Path Connectivity and Coverage in WSN: A Review", *International Journal of Computer Science and Mobile Computing*, Volume 4, Issue 9, Pages 332-337, 2015.
15. Ashish Kumar, Vishal Kumar Arora "Performance and Security Ecaluation By Using SHA3 In WEP", *INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY*, Volume 4, Issue 3, Pages 353-358, 2015.
16. Shubhi Bansal, Vishal Kumar Arora "Distributed and Centralized Clustering Approaches: Leach vs. C-Leach", *HCTL Open Int J Technol Innov Res (IJTIR)*, Volume 14, Pages 1-7, 2015.
17. Chetan Batra, Vishal Kumar Arora "Improved-RED Strategy a Performance Enhancer of MANET", *International Journal of Computer Science and Network Security (IJCSNS)*, Volume 2, Issue 8, Pages 36-41, 2015.
18. Chetan Batra, Vishal Kumar Arora, "RED Strategy for Improving Performance in MANET: A Review", *Journal of Information Sciences and Computing Technologies (JISCT)*, Volume 3, Issue 2, pages 217-221, 2015.
19. Reva Sethi, Vishal Kumar Arora "Image De-noising By Decision Based Expanded Window Median Filter Using Multiple Scanning", *IOSRJCE*, Volume 16, Issue 6, Pages 84-90, 2014.
20. Aashima, Vishal Kumar Arora "Detection and Prevention of Wormhole Attack in MANET Using DSR Protocol", *IOSR Journals (IOSR Journal of Computer Engineering)*, Volume 1, Issue 16, Pages 44-47, 2014.

21. Gurpreet Kaur, Vishal Kumar Arora "A Software Implementation Of RSA Algorithm Using 19 bit Prime Digit Number", *International Journal of Scientific & Engineering Research*, Volume 5, Issue 1, Pages 145-149, 2014.
22. Swati Puri, Vishal Kumar Arora "Routing Protocols in MANET: A Survey", *International Journal of Computer Applications*, Volume 96, Issue 13, 2014.
23. Swati Puri, Vishal Kumar Arora "Performance Evaluation of HTTP and DB Traffic Application Using Proactive and Reactive Routing Protocols", *IOSR Journal of Computer Engineering*, Volume 16, Issue 5, Pages 60-64, 2014.
24. Swati Puri, Vishal Kumar Arora "Performance of MANET: A Review", *International Journal of Engineering Trends and Technology (IJETT)*, Volume 9, 2014.
25. Daljeet Kaur, Vishal Kumar Arora "Five Level Threshold Based Stable Election Protocol for Super Wireless Sensor Networks", *International Journal of Advanced Research in Computer Science and Software Engineering*, Volume 4, Issue 12, Pages 970-978, 2014.
26. Aashima, Vishal Kumar Arora "Wormhole Attack Elimination Technique in Mobile Ad-hoc Networks", *International Journal of Computer Science & Technology*, Volume 5, Issue 4 spl-1, Pages 10-14, 2014.
27. Deep Kaur, Vishal Kumar Arora "Research Agenda for Vertical Handover Between WiMAX and Wi-Fi Networks", *International Journal of Emerging Research in Management & Technology*, 2013.
28. Deep Kaur, Vishal Kumar Arora "Performance Analysis of Vertical Handover between WiMAX and Wi-Fi Network", *International Journal of Advanced Research in Computer Science and Software Engineering*, volume 3, issue 1, page 227-234, 2013.
29. Gurpreet Kaur, Vishal Arora "An efficient implementation of RSA algorithm using FPGA and big prime digit", *IJCCER*, Volume 1, Issue 4, pages 100-103, 2013.
30. Surbhi, Vishal Kumar Arora "A Face Identification Technique for Human Facial Image", *International Journal of Computer Science and Information Technologies (IJCSIT)*, Volume 3, pages 5390-5393, 2012.
31. Parveen Dhillon, Vishal Kumar Arora "A compositional approach of reliable and efficient cloud service selection", *International Journal of Advanced Research in Computer Science and Software Engineering*, pages 376-384, 2012.
32. Surbhi, Vishal Kumar Arora "ROI Segmentation For Feature Extraction From Human Facial Images", *International Journal of Research in Computer Science*, pages 61-64, 2012.

CONFERENCE PAPERS

1. Vishal Arora, Sunny Behal, Charanjit Singh "Communication in WSN", *2nd National Conference on challenges & opportunities in Information Technology (COIT-2008)*, RIMT-IET, Mandi Gobindgarh, Punjab, India, 2008.
2. Sunny Behal, Krishan Kumar, Vishal Kumar Arora "Classification of Flood Based DDoS Attacks", *Proceedings of International Conference on Wireless Networks and Embedded Systems (WECON)*, Pages 521-224, October 18-19, 2014.
3. Deep Kaur, Kirandeep Kaur, Vishal Arora "Qos in wlan using ieee802. 11e: Survey of qos in mac layer protocols", *Proceedings of Second International Conference on Advanced Computing & Communication Technologies*, Pages 468-473, 2012.
4. Divya Prabha, Vishal Kumar Arora "A Survey on LEACH and its Descendant Protocols in wireless Sensor Network", *Proceedings of International Conference on Communication, Computing & Systems*, Pages 162-167, 2014.
5. Divya Prabha, Vishal Kumar Arora "Enhancement Of Network Lifetime Using Multihop Clustering Routing In WSNS", *Proceedings of International Conference on Science, Technology and Management*, Pages 814-824, 2015.
6. Shubhi Bansal, Vishal Kumar Arora "Energy Enhancement Using Area Zoning In Wireless Sensor Networks", *Proceedings of International Conference on Science, Technology and Management*, Pages 931-942, 2015.

7. Kashish Monga, Vishal Arora, Ashish Kumar “Analyzing the behavior of WPA with modification”, *IEEE International Conference on Communication Networks (ICCN)*, Pages 53-56, 2015.

M.Tech THESIS GUIDED

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1. Parveen Dhillon, A compositional approach of reliable and efficient cloud service selection, December 2012
 2. Abhishek Bansal, Enhanced surface reconstruction using Delaunay triangulation algorithm, October 2014
 3. Aashima, Detection and prevention of wormhole attack in MANET using DSR protocol, October 2014
 4. Reva Sethi, Image de-noising by applying multi-pass median filter based on decision based expanded window, December 2014
 5. Swati Puri, Performance Evaluation of HTTP and DB Traffic Application using Proactive and Reactive Routing Protocols, x
 6. Deep Kaur, A static and dynamic parameters analysis approach to improve horizontal and vertical handover in hybrid network, January 2015
 7. Chetan Batra, IRED strategy for improvement in the performance of MANET, November 2015
 8. Ashish Kumar, Security Enhancement in WEP using SHAS, April 2015
 9. Payal Monga, Enhancement of Fault Tolerance in WSN using Grid Deployment, April 2015
 10. Chetan Batra, IRED strategy for improvement in the performance of MANET, November 2015
 11. Daljeet Kaur, Reactive Five Level threshold Sensitive Stable Election Protocol For Wireless Sensor Network, February 2015
 12. Divya Prabha, Enhancement of multi-hop clustering routing Technique in WSN to increase the network Life Time, March 2016
 13. Shbuhi Bansal, Energy enhancement using area Zoning in wireless sensor networks, March 2016
 14. Harpreet Singh, An optimized parallel approach for rigid based job allocation structure, April 2016
 15. Shweta Saini, Optimizing General Self-Organized Tree-Based, August 2016
 16. Gurpreet Kaur, Energy-Balance Routing Protocol For WSN, January 2017
 17. Kashish Monga, Enhancement of network lifetime using improved MOD-LEACH, June 2017
 18. Dolly, Performance and security enhancement of WPA using SHA3, March 2018
 19. Navpreet, Tree Based Energy Efficient Clustering Strategy for WSN, March 2018
 20. Sachin Kumar Bansal, Energy Based Self Organizing Tree based routing strategy for WSN, May 18

SHORT TERM COURSES/ FACULTY DEVELOPMENT COURSES ATTENDED

-
1. 1 week IKGPTU sponsored FDP on Development of faculty in teaching methodology & Education management from July 26-30, 2010 at BMSCET, Muktsar
 2. 2 week AICTE sponsored SDP on Intelligent Computation Techniques from July 4-15, 2011 at SBSSTC, Ferozepur
 3. 1 week NITTTR sponsored STC on Cloud Computing from May 14-18, 2012 at NITTTR, Chandigarh
 4. 2 week AICTE sponsored SDP on Multi Criteria Optimization Tools in research from May 21- June 1, 2012 at SBSSTC, Ferozepur
 5. 1 week TEQIP-II sponsored STC on Engineering Materials from Dec 17-21 2012 at SBSSTC, Ferozepur
 6. 4 days on IBM Seed from April 15-18, 2013 at SBSSTC, Ferozepur

7. 2 week AICTE-TEQIP sponsored FDP on Nature Inspired Computational Intelligence from May 6-17 2013 at SBSSTC, Ferozepur
8. 3 days Technical course on BOTNET Analysis from July 10-12 2013 at Infysec Chennai
9. 1 week TEQIP-II sponsored FDP on New Computing & Emerging Technologies in ICT from Aug 26-30 2013 at SBSSTC, Ferozepur
10. 1 week TEQIP-II sponsored FDP on Soft Skills from Sept 2-6 2013 at SBSSTC, Ferozepur
11. 1 week TEQIP-II sponsored FDP on Recent Trends in optical & Wireless communication system design from Sept 09-13 2013 at SBSSTC, Ferozepur
12. 1 week FDP on Effective Time & Stress Management from Sept 24-28, 2013 at NPC, Udaipur
13. 1 week NITTTR sponsored STC on Cloud Computing from Oct 28 to Nov 1, 2013 at SBSSTC, Ferozepur
14. 1 week Infosys EEP on Agile Software Development from February 3-7, 2014 at Infosys, Chandigarh
15. 2 week AICTE sponsored FDP on Research Methodology from May 25- June 5, 2015 at SBSSTC, Ferozepur
16. 1 week MRSPTU sponsored FDP on Effective Technical Writing Using LATEX from July 3-7 2017. at BSBEC, Fatehgarh Sahib
17. 1 Week NITTTR sponsored STC On Optimization using MATLAB from July 17-21, 2017 at SBSSTC, Ferozepur
18. 1 Week NITTTR sponsored STC on Energy, Environment and Sustainable Development from July 24-28, 2017 at SBSSTC, Ferozepur
19. 1 Week NITTTR sponsored STC on Instructional Delivery from June 4-8, 2018 at SBSSTC, Ferozepur
20. 1 Week on NITTTR sponsored STC Classroom Communication from 27-31 May ,2019 at SBSSTC, Ferozepur
21. 1 Week AICTE sponsored STTP on Mathematical Methods and Computations in Engineering from 1-6 July, 2019 at SBSSTC, Ferozepur

PROFESSIONAL TRAINING / WORKSHOPS ATTENDED

-
1. 1 week Training in IBM SEED program on Rational Software Architect from 15-04-2013 to 18-4-2013 at SBSSTC, Ferozepur.
 2. 1 day TEQIP (Phase-II) workshop on ROLE OF COMMUNICATION, MOTIVATION & TEAM BUILDING IN ENHANCING THE PERFORMANCE OF TEACHERS on May 25th 2013 at SBSSTC, Ferozepur, Punjab, India.
 3. 3 Days Technical course on Botnet Analysis from 10-07-2013 to 12-07-2013 at Infysec, Chennai, India
 4. Organizes 2 day workshop on Android Apps Championship workshop from 18th to 19th March 2014, at SBSSTC, Ferozepur, India.
 5. 2 days workshop on Android Apps Development from 22nd to 23rd March 2018, at SBSSTC, Ferozepur, India.
 6. 2 days workshop on Mobile Apps Development using React Native from 7th-8th March 2019, at SBSSTC, Ferozepur, India.

APPRECIATIONS / AWARDS

1. Appreciation Certificate from Director, SBSSTC, Ferozepur for Coordinating one FDP on New Computing and Emerging Trends in ICT held from 26-30 August 2013 at SBSSTC, Ferozepur.
2. Appreciation Certificate from Director, SBSSTC, Ferozepur for Coordinating 1st International Conference on Communication, Computing and Systems (ICCCS-2014) held at SBSSTC, Ferozepur from August 8-9, 2014.
3. Appreciation Certificate from Director, SBSSTC, Ferozepur for Member of Editorial board of National Conference on Communication, Computing and Systems (NCCCS-2015) held at SBSSTC, Ferozepur from August 24-25, 2015.
4. Appreciation Certificate from Director, SBSSTC, Ferozepur for Session Chair in National Conference on Communication, Computing and Electrical Systems (NCCCES-2016) held at SBSSTC, Ferozepur from November 21-22, 2016.
5. Appreciation Certificate from Director, SBSSTC, Ferozepur for Member of Editorial board of National Conference on Communication, Computing and Electrical Systems (NCCCES-2016) held at SBSSTC, Ferozepur from November 21-22, 2016.
6. Appreciation Certificate from HOD, CSE, SBSSTC, Ferozepur for the sincerity and hard work for the successful completion of academic work during July-Dec 2017 session.
7. Appreciation Certificate from Deputy Commissioner, Ferozepur for successfully conducting Lok Sabha Elections-2017.
8. Appreciation Certificate from Director, SBSSTC, Ferozepur for hard work done for the betterment of the Institute during academic year 2018-19.

PERSONAL DETAILS

Father's Name: Sh. Kewal Krishan Arora
Date of Birth: 7th August
Marital Status: Married
Language Proficiency: English, Hindi and Punjabi.

SUBJECT TAUGHT

PG Level

Advance Software Engineering
Advanced Programming Language
Distributed Systems
Compiler Design
Business Information System

UG Level

Object Oriented Programming using C++
Database Management System
Data Communication
Software Engineering
Theory of Computation
Java
System Analysis and Design

TECHNICAL PROFICIENCY

Programming languages : Turbo C++, Prolog, Java, Eclipse

Front ends : Visual Basic

Back ends : SQL server, Microsoft access, MySQL

Simulators : MATLAB, OPNET

Operating systems : Windows variants

Analysis tools : ACID, BASE, WAMP, LAMP, Snort