

DR. SUNNY BEHAL

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SBS State Technical Campus
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PARTICULARS

EDUCATION

Ph. D. in Computer Science and Engineering, *June 2018*
I.K.G. Punjab Technical University, Kapurthala, Punjab, India

M. Tech. in Computer Science and Engineering, *May 2010*
Guru Nanak Dev Engineering College, Ludhiana
I.K.G. Punjab Technical University, Kapurthala, Punjab, India
69.50 %

B. Tech. in Computer Science and Engineering, *July 2002*
Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur
I.K.G. Punjab Technical University, Kapurthala, Punjab, India
68.75 %

RESEARCH INTERESTS

My research interests span the areas of network security, DDoS attacks and Botnets. I have a specific interest in algorithms for Network traffic analysis, Defending from DDoS attacks, Malware detection, IoTs and software defined networking.

DISSERTATION

- Doctorate of Philosophy (Ph.D.)
Title: "Defense of Internet from DDoS attacks: A Real-Time Experimentation"
Advisor: Dr. Monika Sachdeva and Dr. Krishan Kumar

In this Thesis, an anomaly based distributed, flexible, automated and collaborative (D-FAC) defense system has been proposed to detect different types of DDoS attacks and FEs. The proposed comprehensive detection approach uses the idea of computing source IP address based information distance between network traffic flows to detect different types of DDoS attacks and FEs. D-FAC defense system utilizes a novel, highly convergent information theory based generalized ϕ -Divergence metric that elicits greater information distance between attack and legitimate traffic flows at low α -order leading to better detection results and lesser computational complexity as compared to the existing information theory based solutions. An emulation-based real distributed denial of service testbed (DDoSTB) have further strengthened our claim of using source IP address based ϕ -Divergence metric. D-FAC defense system is robust, adaptive and customizable according to the dynamic network behavior. All the threshold values used by D-FAC defense system are calibrated using Receiver Operating Characteristics curves (ROC). The results of ϕ -Divergence based D-FAC defense system are compared with existing Shannon entropy, Renyi's generalized entropy and GID divergence metrics based defense systems. D-FAC defense system is able to (a) detect different types of DDoS attacks and FEs, (b) collaborate and filters attack traffic at each of the ingress PoPs, (c) generate an automated response during the occurrence of these events, (d) react to DDoS attacks and FEs without any manual intervention, and (e) characterize different types of network traffic with efficacy.

- Master of Technology (M.Tech.) Title: "Signature-based detection and prevention of Botnets"
Advisor: Mr. Amanpreet Singh Brar, Dr. Krishan Kumar

This thesis focuses on the detection and prevention of botnets based on the concept of analyzing outbound traffic i.e. Extrusions only inside a network. Having this goal in sight, we analyzed the malicious outbound

traffic of infected hosts. The classification of malicious outbound traffic includes the following five traffic categories: command and control traffic, outbound scan, type of attack, type of protocols used and unusual ports. Based on the open source and freely available softwares, we developed a network-based customized solution called N-EDPS. It monitors the outbound traffic for botnet detection in first phase and in the second phase, develop/update the new rules/signatures, tune the rule set of N-EDPS as per the network of educational institute to drop the traffic in real time related to botnets.

TEACHING EXPERIENCE

- **August 2002 to 25th July 2005** Lecturer, Bhai Maha Singh College of Engineering, Muktsar, Punjab, India.
- **29th July 2005 to till date** Assistant Professor, Shaheed Bhagat Singh State Technical Campus, Ferozepur.

SPONSORED RESEARCH PROJECTS

- Completed one Research Promotion Scheme (RPS) project Sponsored by All India Council for Technical Education (AICTE), New Delhi entitled "Development of testbed facility for the evaluation of defense techniques against DDoS attacks", sanctioned under Research Promotion Scheme (RPS) scheme of worth Rs. 7.5 Lacs in the capacity of *Co-Principal Investigator*.

IMPORTANT ADMINISTRATIVE RESPONSIBILITIES

- Board of Studies Member, General Fitness, IKGPTU, Kapurthala from Feb 2012 to 2015.
- Board of Studies Member, Humanities and Social Studies, MRSPTU, Bathinda from Jan 2016 to till date.
- Board of Studies Member, Department of Applied Sciences and Humanities, SBS State Technical Campus, Ferozepur from 2018 to till date.
- Course Coordinator, Advanced Databases, M.Tech. CSE, M.Tech. E-Security, MRSPTU, Bathinda, 2017.
- Training and Placement Officer from 28-03-2011 to 25-07-2014 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, India.
- Alumni President of SBS State Technical Campus, Ferozepur, India from 2010 to 2014.
- Single Point of Contact (SPoC) for Campus Connect program of Infosys Technologies Ltd from 2012 to 2015 and December 2017 to till date.
- Asstt Training and Placement Officer from Jan 2006 to July 2011 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, India.
- Training and Placement I/C of CSE Department from Jan 2006 to Aug 2011 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, India.
- Coordinator, Skill Development Initiative (SDI) Scheme of Punjab Govt. from 2010 to 2012 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, India.
- Member, Industry Institute Interaction Cell (IIIC) from 2011 to 2014 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, India.
- Member, Office of External Affairs from 16-9-2012 to 25-2-2016 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, India.

RESEARCH CREDENTIALS

ResearchGate (RG) Score - 15.34

Scopus Author ID: 56901110700

ResearcherID: P-7215-2016

ORCID id: <https://orcid.org/0000-0002-9701-4358>

Google Scholar: Total citations as on date 255, h-index =9 and i-index = 9

Scopus: Total citations as on date 60, h-index=6 and Documents=20

JOURNAL PAPERS

1. Sunny Behal, Krishan Kumar, Monika Sachdeva, "D-FACE: An anomaly based distributed approach to detect DDoS attacks and Flash Events", *Elsevier Journal of Network and Computer Applications*, vol. 111, pp. 49-63, 2018, **SCI-E, Thomson Reuters IF-3.99**.
2. Sunny Behal, Krishan Kumar, Monika Sachdeva "A Generalized Detection System to detect Distributed Denial of Service attacks and Flash Events for Information Theory Metrics", *Turkish Journal of Electrical and Computer Sciences*, vol. 26, No. 4, pp. 1759-1770, 2018, **SCI-E, Thomson Reuters IF-0.580**.
3. S. Behal, K. Kumar, M. Sachdeva, "D-FAC: A novel ϕ -Divergence based distributed DDoS defense system", *Journal of King Saud University-Computer and Information Sciences*, March 2018, **E-SCI, Thomson Reuters, SCOPUS, Open Access, Accepted**.
4. Sunny Behal, Krishan Kumar, "Detection of DDoS attacks and Flash Events using Information Theory metrics - An empirical investigation", *Elsevier Computer Communications*, vol. 103, pp. 18-28, 2017, **SCI-E, Thomson Reuters IF-2.613**.
5. Sunny Behal, Krishan Kumar, "Detection of DDoS attacks and Flash Events using Novel Information Theory metrics", *Elsevier Computer Networks*, vol. 116, pp. 96-110, 2017, **SCI-E, Thomson Reuters IF-2.522**.
6. Sunny Behal, Krishan Kumar, Monika Sachdeva, "Characterizing DDoS attacks and Flash Events: Review, Research Gaps and Future Directions", *Elsevier Computer Science Review*, vol. 25, pp. 101-114, 2017, **SCOPUS, SCI-E, Thomson Reuters**.
7. Sunny Behal, Krishan Kumar, "Characterization and Comparison of DDoS Attack Tools and Traffic Generators- A Review", *International Journal of Network Security*, vol. 19, no. 3, pp. 383-397, 2017, **SCOPUS, DBLP, Open Access**.
8. Sunny Behal, Krishan Kumar, Monika Sachdeva, "Discrimination of Flash Events from DDoS Attacks - A Comprehensive Review", *International Journal of Network Security*, vol. 19, no. 5, pp. 734-741, 2017, **SCOPUS, DBLP, Open Access**.
9. Sunny Behal, Krishan Kumar, "Characterization and Comparison of DDoS Attack Tools and Traffic Generators- A Review", *International Journal of Network Security*, pg no: 383-397, vol. 19, No. 3, May 2017, (DOI: 10.6633/IJNS.201703.19(3).07), **SCOPUS**, ISSN: 1816-3548.
10. Sunny Behal, Krishan Kumar, Monika Sachdeva "Discrimination of Flash Events from DDoS Attacks - A Comprehensive Review", *International Journal of Network Security*, pg no: 734-741, vol. 19, No. 5, Sept 2017, (DOI: 10.6633/IJNS.201709.19(5).11), **SCOPUS**, ISSN: 1816-3548.
11. Sunny Behal, Krishan Kumar, "Measuring the impact of DDoS attacks on Web services - A Realtime Experimentation", *International Journal of Computer Science and Information Security*, vol. 14, no. 9, pp. 323-330, 2016, **E-SCI, Thomson Reuters, Open Access**.
12. Sunny Behal, Krishan Kumar, "A Novel Information Divergence Metric for Detecting DDoS Attacks", *International Journal of Computer Science and Information Security*, vol. 14, no. 10, pp. 843-848, 2016, **E-SCI, Thomson Reuters, Open Access**.
13. Sunny Behal, Krishan Kumar, "Trends in Validation of DDoS Research", *Elsevier Journal of Procedia Computer Science*, vol. 85, pp. 7-15, 2016, **SCOPUS**.
14. Shifali, Monika Sachdeva, Sunny Behal, "Discrimination of DDoS attacks and Flash Events using Pearson's Product Moment Correlation Method", *International Journal of Computer Science and Information Security (IJCSIS)*, Vol. 14 No 10, Page No. 382-389, 2016, ISSN: 1947-5500, **Thomson Reuters, E-SCI**.
15. Ajitpal Kaur, Daljeet Kaur, Krishan Kumar, Sunny Behal, "Performance Analysis of Web Services Under HTTP Attack Using GENI Testbed", *International Journal of Control Theory and Applications (IJCTA)*, Pg no. 67-74, Vol. 9, No. 22, Oct 2016. ISSN: 0974-5572, **SCOPUS (2010-2016)**.
16. Shifali, Monika Sachdeva, Sunny Behal, "Having an Eagle eye on GENI", *International Journal of Control Theory and Applications (IJCTA)*, Pg no. 433-474, Vol. 9, No. 20, Oct 2016, ISSN: 0974-5572, **SCOPUS (2010-2016)**.
17. Harjeet Kaur, Krishan Kumar, Sunny Behal, "Analysis of Web Services under HTTP attack Using Real Time Testbed", *International Journal of Control Theory and Applications (IJCTA)*, Pg no. 279-292, Vol. 9, No. 22, Oct 2016, ISSN: 0974-5572, **SCOPUS (2010-2016)**.
18. Sunny Behal, Krishan Kumar, "Trends in Validation of DDoS Research", *Elsevier Procedia Computer Science Journal*, Pg no: 7-15, vol. 85, 2016 doi:10.1016/j.procs.2016.05.170, ISSN: 1877-0509, **SCOPUS**.

19. Gursharan Singh, Sunny Behal, "Advanced Memory Reusing Mechanism for Virtual Machines in Cloud Computing", *Elsevier Procedia Computer Science Journal*, vol-57, pg no. 91-103 doi:10.1016/j.procs.2015.07.373, **SCOPUS**.
20. Kiranjot Kaur, Sunny Behal, "Designing a Secure Text-Based CAPTCHA", *Elsevier Procedia Computer Science Journal*, vol. 57, Pg no. 122-125, doi:10.1016/j.procs.2015.07.381, **SCOPUS**.
21. Pratibha, Sunny Behal, Pritpal Singh, "Face Recognition system using Genetic Algorithm", *Elsevier Procedia Computer Science Journal*, Pg no: 410-417, vol-85, 2016, doi:10.1016/j.procs.2016.05.183, ISSN: 1877-0509, **SCOPUS**.
22. Rinkel Mehto, Monika Sachdeva, Sunny Behal, "Performance measurement of web services UDP attack using GENI testbed", *International journal of innovations in Engineering and Technology (IJJET)*, Vol. 7, No. 4, Pg No. 481-489, 2016. ISSN:2319-1058
23. 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*, 119(21), Pg no.:28-32, June 2015, DOI: 10.5120/21362-4378, IF-0.715, ISSN: 0975-8887.
24. Navneet Kaur, Sunny Behal, "Audio Steganography Techniques: A Survey", *International Journal of Engineering Research and Applications (IJERA)*, Vol-4, Issue 6, June 2014, ISSN: 2248-9622, Pg no:94-100
25. Navneet Kaur, Sunny Behal, "A Survey of various types of Steganography and Analysis of Hiding Techniques", *International Journal of Trends and Technology (IJETT)*, Vol-11, Issue 8, May 2014. ISSN: 2231-5381, Pg no: 388-392 DOI: 10.14445/22315381/IJETT-V11P276.
26. Abhishek Patial, Sunny Behal, "Secure User Data in Cloud Computing using RSA Algorithm", *International Journal of Engineering Sciences & Research Technology (IJESRT)*, vol. 3 (12), pg no. 176-180, Dec 2014, ISSN: 2277-9655.
27. Navjot Kaur, Sunny Behal, "P2PBDS: Peer to Peer Botnet Detection System", *IOSR Journal of Computer Engineering (IOSR-JCE)*, Volume 16, Issue 5, Ver. V (Sep - Oct. 2014), PP 28-33. ISSN: 2278-0661, IF:1.213, DOI: 10.6084/m9.figshare.1206128
28. Kiranjot Kaur, Sunny Behal, "Captcha and its Techniques", *International Journal of Computer Sciences & Information Technologies (IJCSIT)*, vol 5(5), pg no: 6341-6344, 2014, ISSN: 0975-9646.
29. Amandeep Singh, Sunny Behal, "Ant colony Optimization for improving Network lifetime in Wireless Sensor Networks", *International Journal of Application or Innovation in Engineering & Management (IJAIEM)*, Vol-2, Issue-4, April 2013, page no. 346-352 ISSN: 2319-4847.
30. Arshdeep Singh, Sunny Behal, Ankit Arora, "Efficiency Measurement for Effective Stress Management in Heterogeneous 2-D Mesh Processor", *International Journal of Computer Applications (IJCA)*, vol-81, No. 12, Pg no 29-33, Nov 2013. ISSN: 0975-8887, DOI:10.5120/14066-2330, IF: 0.715
31. Kulvir Singh, Sunny Behal, "A Review on Routing Protocols in Wireless Mesh Networks", *International Journal of Application or Innovation in Engineering & Management (IJAIEM)*, pg no. 143-149, Vol-2, Issue-2, Feb 2013. ISSN: 2319 - 4847
32. Navjot Sharma, Sunny Behal, "A Systematic way of Soft-Computing Implementation for Wireless Sensor Network Optimization using Bacteria Foraging Optimization Algorithm: A Review", *International Journal of Application or Innovation in Engineering & Management (IJAIEM)*, Vol-2, Issue-2 pg no. 150-154, Feb 2013, ISSN: 2319 - 4847.
33. Ritika Arora, Sunny Behal, "Phishing Defense Mechanism", *International Journal of Computer Science and Technology (IJCSST)*, vol-3, issue-3, version-1, July 2012, ISSN: 0976-8491 (online), Pg no-141-144.
34. Abhishek Patial, Sunny Behal, "RSA Algorithm achievement with Federal information processing Signature for data protection in Cloud Computing", *International Journal of Computers & Technology (IJCT)*, vol. 3 No.1, Pg No. 34-38, Aug 2012, DOI:10.1.1.303.1359.
35. Amandeep Singh, Sunny Behal, "Termite Hill Protocol for Network Lifetime in Wireless Sensor Networks: Review of Selected Techniques", *International Journal of Emerging Technology and Advanced Engineering (IJETAE)*, Volume 2, Issue 10, Page No. 453-458, October 2012, ISSN: 2250-2459, DOI:10.1.1.414.759
36. Sunny Behal, Krishan Kumar, "Extrusion: An Outbound Traffic based approach to detect Botnets," *International Journal of Information and Telecommunication Technology*, Vol. 2, Issue 1,2010, ISSN: 0976-5972, pages 71-76.
37. Sunny Behal, Krishan Kumar, "Classification of C & C based Botnet Architectures," *International Journal of Engineering & Information Technology*, ISSN 0975-5292, Vol. 1(Oct, 2009), pages 28-34.

CONFERENCE PAPERS

1. Shipra Bharti, Sunny Behal, Vishal Sharma, "Security Enhancements for high quality image transaction with hybrid Image Steganography Algorithm, in *2nd IEEE International conference on Computing Methodologies and Communication (ICCMC2018)* held on 15-16 Feb 2018 at Surya Engineering college, Erode, India, **SCOPUS**.
2. Gursharanjit Kaur, Sunny Behal, Shifali, "An information divergence based approach to detect Flooding DDoS attacks and Flash Crowds", *IEEE 3rd International Conference on Applied and Theoretical Computing and Communication Technology (iCATccT-2017)*, held on 21-23 December 2017 at SSIT, Karnataka, India, **SCOPUS**, Pg No. 251-258.
3. Sukhvirpal Kaur, Sunny Behal, Gulshan Kumar, "Detection of DDoS Attacks using Weka Tool : A Case Study", in *National Conference on Communication, Computing & Electrical Systems (NCCCES-2017)*, Pg No. 5-11, Nov. 2017 at SBS State Technical Campus, Ferozepur.
4. Shipra Bharti, Sunny Behal, "Study of Steganography and its techniques", in *National Conference on Communication, Computing & Electrical Systems (NCCCES-2017)*, Pg No. 12-17, Nov. 2017 at SBS State Technical Campus, Ferozepur.
5. Harvarinder Kaur, Japinder Singh, Sunny Behal, Krishan Kumar, "A Review of CAPTCHA Techniques Used To Defend Against Application Layer DDoS Attacks", in *National Conference on Communication, Computing & Electrical Systems (NCCCES-2016)*, Pg No. 25-28, Nov. 2016 at SBS State Technical Campus, Ferozepur.
6. Gursharanjeet Kaur, Pawan Luthra, Sunny Behal, Krishan Kumar, "Mitigation of Flood based DDoS Attack using Captcha - A Review", in *National Conference on Communication, Computing & Electrical Systems (NCCCES-2016)*, Pg No. 11-18, Nov. 2016 at SBS State Technical Campus, Ferozepur.
7. Pritpal Singh, Sunny Behal, Krishan Kumar, "Performance Enhancement of a Malware Detection System using Score Based Prioritization of Snort Rules", *IEEE International Conference on Green Computing and Internet of Things (ICGCIoT)*, 2015, 8-10 Oct 2015 at Noida, Pg no. 1150-1155, DOI: 10.1109/ICGCIoT.2015.7380636, **SCOPUS**.
8. Harjeet Kaur, Sunny Behal, Krishan Kumar, "Characterization and Comparison of DDoS Attack Tools", *IEEE International Conference on Green Computing and Internet of Things (ICGCIoT)*, 2015, 8-10 Oct 2015 at Noida, Pg no. 1139-1145, DOI: 10.1109/ICGCIoT.2015.7380634, **SCOPUS**.
9. Kulvir Singh, Sunny Behal, Vishal Kumar Arora, "An Failure Adaptive Energy Optimized Multi-Hop DLQAR Routing in WSN", *International Multi Track conference on Sciences, Engineering and Technical Innovations*, May 23-24, 2015 held at CT Institute of Engineering, Management & Technology, Jalandhar. ISBN: 978-81-929077-2-7. Pg No- 339-342
10. Ajitpal Kaur, Krishan Kumar, Sunny Behal, "Network Research validation using GENI platform", *National Conference on Communication, Computing & Systems (NCCCS-2015)*, Aug 24-24, 2015 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
11. Sheena Wadhwa, Krishan Kumar, Daljeet Kaur, Sunny Behal, "Detection of DDoS attacks using Entropy: A Review", *National Conference on Communication, Computing & Systems (NCCCS-2015)*, Aug 24-24, 2015 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
12. Navneet Kaur, Sunny Behal, "Steganography: Review Study & Comparative Analysis", *International Multi Track Conference on Science, Engineering & Technical innovation*, pg no. 456-460, Volume-1, Dated: 3-4 June, 2014
13. Navneet Kaur, Sunny Behal, "Audio Steganography using LSB Edge detection algorithm", in *International Conference on Communication, Computing & Systems (ICCCS-2014)*, 8-9 Aug 2014, 180-183, 2014.
14. Jagdeep kaur, Sunny Behal, "An improved Median Filter for De-noising Gray Scale Images", *International Conference on Information, Computing and Telecommunications (ICICT)*, 24 Feb 2013, New Delhi.
15. Manpreet Kaur, Sonika Jindal, Sunny Behal, "A study of Digital Image watermarking", *International Conference on Competitiveness & Innovativeness in Engineering, Management & Information Technology (ICCIEMI-2012)*, MAIMT-Jagadhri, 29th Jan, 2012, 126 - 136 ISSN: 2249-3905.
16. Jagdeep Kaur, Sunny Behal, Sonika Jindal, "A Study of Digital Image Steganography", *International Conference on Advancements in Computing and Communication (AICC-2012)*, 23-25 Feb 2012, 242-246
17. Ritika Arora, Sunny Behal. "PHONEY: Mimicking User Response to Detect Phishing Attacks", *Proceedings of International Conference on Advances in Computer and Communication Technology (ACCT-2012)*, 131-134, Feb 2012.

18. Ritika Arora, Sunny Behal, "Phishing Attacks", *National Conference CECT-2012* at Rayat Bahra Engineering College, Ropar, Punjab, 174-176, April 2012.
19. Sunny Behal, Krishan Kumar, "An Experimental Analysis of Extrusions to detect Malware", *Proceedings of 2nd IEEE International conference on ICCCT-2011*, Sept 2011. Page-474-478, DOI: 10.1109/ICCCT.2011.6075135, ISBN: 978-1-4577-1385-9, **SCOPUS**.
20. Sunny Behal, Krishan Kumar, "A Review on Botnet Defense Mechanisms: Detection, Tracing, Mitigation and Prevention", *IEEE International Conference on Computer Engineering & Technology (ICCET-2010)*, 13-14 Nov., 2010, page no. 25-33. ISBN No. 978-81-920748-1-8, **SCOPUS**.
21. Ritika Arora, Sunny Behal, "IP Spoofing", *IEEE Student Conference on Cognizance of Applied Engineering & Research (ICAER-2010)*, Panjab University, **SCOPUS**.
22. Sunny Behal, Amanpreet S. Brar, Krishan Kumar, "Signature-Based Botnet Detection and Prevention," *Proceedings of International Symposium on computer Engineering & Technology (ISCET-2010)*, Pages 127-132, March 19-20, 2010.
23. Vishal Arora, Sunny Behal, Charanjit Singh, "Communication in WSN", *2nd National Conference on challenges & opportunities in Information Technology (COIT-2008)*, RIMT, Mandi Gobindgarh, Mar 29-2008, Pg no 202-206.
24. Vishal Arora, Sunny Behal, Richa Sawhney, "Key issues in Adhoc Networks", *National conference on Recent Trends in Computer Science and Information Technology*, BCET, Gurdaspur, 16th August, 2008.
25. Sunny Behal, Krishan Kumar, Vishal Arora, "Classification of Flood Based DDoS Attacks," *Proceedings of International Conference on Wireless Networks and Embedded Systems (WECON)*, Pages 521-524, October 18-19, 2008.

BOOK CHAPTERS

1. Sajal Bhatia, Sunny Behal, Irfan Ahmed, "Distributed Denial of Service Attacks and Defense Mechanism: Current Landscape and Future Directions" *Book Chapter on "Versatile Cybersecurity"*, Publisher Springer, Jan 2018 (Accepted),
2. Nikhil Goyal, Sunny Behal, "FACE RECOGNITION USING LOCAL BINARY BLOCKWISE PATTERN", book on *Intelligent Engineering Informatics-2018*, Publisher: Springer Singapore, e-ISBN: 978-981-10-7566-7, Scopus Indexed.

PG DISSERTATIONS GUIDED

1. Ritika Arora, Phishing Defense Mechanism using LinkGuard Algorithm, 2012.
2. Amandeep Singh, Ant Colony Optimization for Improving Network Lifetime in Wireless Sensor Networks, 2013.
3. Jagdeep Kaur, An improved Method of Biorthogonal Wavelet families for Image Compression, 2013.
4. Manpreet Kaur, An improved Median Filter for Denoising Grey Scale Images, 2013.
5. Gagandeep, Detection and Prevention of Sink Hole Attacks on MANET Reactive Protocols, 2013.
6. Navneet Kaur, Multistage Steganography for secure Data communication using Least Significant Bit Edge Detection (LSB-ED), 2014.
7. Arshdeep Singh, Efficiency Measurement for Stress Management in Heterogenous 2D Mesh Processor, 2014.
8. Gursharan Singh, Advanced Memory Reusing Mechanism for Virtual Machines, 2014.
9. Richa Sawhney, Detection of IRC based Botnets, 2014.
10. Navjot Sharma, Optimization of Wireless Sensor Networks using Bacteria Foraging Optimization, 2014.
11. Pritpal Singh, Performance Enhancement of a Malware Detection system using score based Prioritization of snort rules, 2015
12. Abhishek Patial, RSA Algorithm Achievement with Federal Information Processing Signature for Data Protection in Cloud Computing, 2015.
13. Kiranjot Kaur, Designing a Secure Text based Captcha, 2015.
14. Navjot Kaur, P2PBDS: Peer to Peer Botnet Detection System, 2015.
15. Kulvir Singh, An improvement of Network Life time using DLQAR protocol in Wireless Sensor Network, 2015.

16. Pratibha, Face Recognition system using Genetic Algorithm, 2016.
17. Shifali, Co-DFEDD: Correlation based DDoS attack and Flash Events Detection and Discrimination, 2016.
18. Harjeet Kaur, Analysis of web services under HTTP attacks using Real Time Testbed, 2016.
19. Rinkel Mehto, Analysis of web services under UDP attacks using GENI Testbed, 2016.
20. Ajitpal Kaur, Analysis of web services under HTTP attacks using GENI Testbed, 2016.
21. Nikhil Kumar, Face Recognition using Local Binary Pattern-Blockwise method, 2018.

SHORT TERM COURSES / FACULTY DEVELOPMENT PROGRAMS ATTENDED

1. One week Infosys Sponsored FEP on "Cloud Computing" from Dec 4th to Dec 8th, 2017 at UIET, Chandigarh.
2. One week NITTTR Sponsored FDP on "Energy, Environment and Sustainable Development through ICT" from July 24th to July 28th 2017 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
3. One week NITTTR Sponsored FDP on "Optimization using MATLAB" from July 17th to July 21st 2017 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
4. One week MRSPTU Sponsored FDP on "Effective Technical writing using Latex" from June 3rd to June 7th 2017 at Baba Banda Singh Bahadur Engineering college, Fatehgarh Sahib, Punjab.
5. Two weeks AICTE Sponsored FDP on "Research Techniques", from May 25 to June 5 2015 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
6. One week TEQIP-II sponsored FDP on "Recent Computing Paradigms" from July 7-11, 2014 at GNDEC, Ludhiana.
7. One week Faculty Enablement program on "Mobile Application Development" from 6 Jan - 10 Jan 2014 at RK University, Rajkot organized by Infosys.
8. One week NITTTR Sponsored FDP on "Cloud Computing" from Oct 28th to Nov 1, 2013 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
9. One week FDP on "Recent Trends in Optical & Wireless Communication systems design" from Sept 9-13, 2013 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
10. One week FDP on "Soft Skills for Technical Teachers" from Sept 2 - 6, 2013 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
11. One week FDP on "Network Security Administration" from 21 Oct 2013 to 25 Oct 2013 at ESCI, Hyderabad.
12. one week FDP on "Effective Time & Stress Management" from 24-Sept 2013 to 28 Sept 2013 at National Productivity Council, Udaipur.
13. One week TEQIP-II sponsored FDP on "New Computing and Emerging Technologies in ICT" from 26 Aug to 30 August 2013 at SBS State Technical Campus, Ferozepur.
14. Two weeks AICTE sponsored FDP on "Nature Inspired Computational Intelligence" from May 6th - May 17th 2013 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
15. One week TEQIP (phase-II) STC on "Research Methodology Tools & Techniques" from Dec 3rd - Dec 7th 2012 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
16. One week TEQIP (phase-II) STC on "Applied Soft Computing" from Nov 26th - Nov 30th 2012 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
17. Two weeks AICTE sponsored SDP on "Multi Criteria Optimization tools in Research" from May 21st - June 1st 2012 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
18. One week STC on "Cloud Computing" from May 14th - May 18th 2012 at NITTTR, Chandigarh.
19. Two weeks AICTE sponsored SDP on "Intelligent Computational Techniques" from July 4th - July 15th 2011 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab.
20. One week FDP on "Development of faculty in Teaching methodology and Education management" from July 26th - July 30th 2010 at BMS college of Engg, Muktsar, Punjab.
21. One week FDP on "Entrepreneurship" from Dec 27th - Dec 31st 2004 on behalf of Deptt of Science and Technology, Govt. of India, Delhi, organized by North India Technical Consultancy Organization Ltd. (NIT-CON).

PROFESSIONAL TRAINING / WORKSHOPS ATTENDED

1. Two days workshop on Android Apps Development from 22nd – 23rd March 2018, at SBSSTC, Ferozepur, India.
2. One and a half Day Tutorial on "Introduction to Mobile systems and Wireless Sensor Networks" on 05-06-2014 to 06-06-2014 at Indian Institute of Technology, Ropar, India.
3. Three Days Technical course on "Botnet Analysis" from 10-07-2013 to 12-07-2013 at Infysec, Bangalore, India.
4. One day TEQIP (Phase-II) workshop on "ROLE OF COMMUNICATION, MOTIVATION & TEAM BUILDING IN ENHANCING THE PERFORMANCE OF TEACHERS" on May 25th 2013 at Shaheed Bhagat Singh State Technical Campus, Ferozepur, Punjab, India.
5. One week Training in IBM SEED program on Rational Software Architect from 15-04-2013 to 18-4-2013 at SBSSTC, Ferozepur.
6. One day workshop on "A-View Basics" Workshop on 20-5-2011 at PTU, Kapurthala in collaboration with National Mission on Education through ICT (NMEICT) of MHRD, Govt. of India.
7. CCNA 1: Networking Basics from Aug-Dec 1999 at Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur, Punjab, India.
8. CCNA 2: Router and Routing Basics Jan-May 2000 at Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur, Punjab, India.
9. CCNA 3: Switching Basics and Intermediate Routing Aug-Dec 2000 at Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur, Punjab, India.
10. CCNA 4: WAN Technologies Jan-May 2001 at Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur, Punjab, India.

APPRECIATIONS / AWARDS

1. Appreciation Certificate from Director, SBSSTC, Ferozepur for organizing two State Level Job fairs under "Ghar Ghar Rozghar" Scheme of Punjab Government in 2017 and 2018 respectively.
2. Silver Level Faculty Award from Infosys for 2017.
3. Appreciation certificate from Director, SBSSTC, Ferozepur to act as Co-coordinator for Coordinating two weeks joint project on "Cultural differences" from May 19th to June 1st , 2017 under faculty/students academic exchange program between NHL university of Applied Sciences, Netherlands and SBSSTC, Ferozepur.
4. Bronze Level Faculty Award from Infosys for 2016.
5. Appreciation Certificate in Lok Sabha Elections-2014 from DC, Ferozepur.
6. 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.
7. Coordinator of AppsFluxus-2014 National Android Apps Championship Workshop held from 18th - 19th March 2014 at SBSSTC, Ferozepur.
8. 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.
9. Appreciation Certificate in Lok Sabha Elections-2009 from DC, Ferozepur.
10. Appreciation Certificate in Vidhan Sabha Elections-2007 from DC, Ferozepur.

PROFESSIONAL ACTIVITIES AND SERVICE

- Technical Program Committee Member of 3rd *International Conference on Green Computing and Engineering Technologies (ICGCET-2017)*, Ireland on, August 8-10, 2017.
- Technical Program Committee Member of 3rd *International Conference on Recent Trends in Computer Science and Electronics (RTCSE-2018)* held on 02-03 January 2018 at Thailand.
- Technical Program Committee Member of 4th *International Conference on Green Computing and Engineering Technologies (ICGCET-2018)* and *10th IEEE International Conference on Computational Intelligence and Communication Networks (CICN)*. The conference will be held on 17 Aug - 19 Aug 2018 at Denmark.
- Board of Governors Member, SUWIDHA Centre, Distt. Ferozepur in 2009-10.

- Distt. System Administrator, Nodal Officer IT for different Assembly and Lok-Sabha Elections held from 2007 to 2015 at Ferozepur.
- ISTE Life Member LM-35455
- IEEE Membership No.: 92722266
- Computer Science Teachers Association (CSTA), Member No.: 41765715
- Internet Society Global Member No.: 139195
- IAENG -International Association of Engineers, Membership No. 174235
- Member of The Society of Digital Information and Wireless Communications (SDIWC): 21718
- Technical Reviewer of
 - Elsevier ADHOC Networks, Thomsen Reuters, SCI
 - Elsevier Computers and Security, Thomsen Reuters, SCI
 - Security and Communication Networks, Thomsen Reuters, SCI
 - Australasian Journal of Information Systems, Thomsen Reuters, E-SCI
 - International Journal of Network Security, SCOPUS, DBLP Indexed
 - Journal of Bulletin of Electrical Engineering and Informatics, Indonesia, SCOPUS Indexed.
 - International Journal of Electrical and Computer Engineering, Indonesia, SCOPUS Indexed.
 - Journal of Computational Methods in Sciences and Engineering (JCMSE) of IOS Press, Thomsen Reuters, E-SCI, SCOPUS Indexed.

LANGUAGES

Proficient in English, Hindi and Punjabi.

SUBJECT TAUGHT

PG Level

Advanced Database Systems
 Compiler Design
 Digital Image Processing
 Research Methodologies
 Distributed Systems

UG Level

Mobile Application Development using Android
 Object Oriented Programming using C++
 System Programming
 Operating System
 Programming Languages
 Symbolic Logic and Logic Programming
 Computer Graphics
 Data Communication
 Database Management System
 Design and Analysis of Algorithms

TECHNICAL PROFICIENCY

Programming languages : Turbo C++, Prolog, Python, Java, Android Studio, Eclipse

Front ends : Visual Basic, Power Builder

Back ends : SQL server, Microsoft access, MySQL

Simulators : MATLAB, CORE

Networking : LAN/WAN Designing, Configuration and troubleshooting on CISCO products

Operating systems : Windows variants, Linux Ubuntu

Analysis tools : Gnuplot, Weka, ACID, BASE, Wireshark, Tshark, Monosek, WAMP, LAMP, Snort, etc.

REFERENCES

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