

# Curriculum Vitae

## Paramvir Singh

Assistant Professor

Department of Computer Science and Engineering

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*"The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low and we reach it."*  
– (attributed to) Michelangelo

## Education

Jul. 98 – Jun. 02	BTech in Computer Science and Engineering Shaheed Bhagat Singh College of Engineering and Technology, Ferozepur, Punjab, India <i>Affiliation:</i> Punjab Technical University, Jalandhar, Punjab, India
Aug. 03 – Jul. 05	ME in Computer Science and Engineering Punjab Engineering College, Chandigarh, India <i>Affiliation:</i> Panjab University, Chandigarh, India
Oct. 06 – Dec. 11	PhD in Computer Science and Engineering Guru Nanak Dev University, Amritsar, Punjab, India

## Employment

Mar. 12 – till date	Dr B R Ambedkar National Institute of Technology, Jalandhar, Punjab, India Assistant Professor (Regular), Department of Computer Science and Engineering
Jan. 12 – Mar. 12	Lovely Professional University, Jalandhar, Punjab, India Assistant Professor (Regular), Department of Computer Science and Engineering
Jan. 08 – Dec. 11	Dr B R Ambedkar National Institute of Technology, Jalandhar, Punjab, India Assistant Professor (Contract), Department of Computer Science and Engineering
Jul. 05 – Jan. 08	Beant College of Engineering and Technology (BCET), Gurdaspur, Punjab, India Lecturer (Contract), Department of Computer Science and Engineering
Aug. 02 – Jun. 03	Schwa Solutions Inc., New Delhi, India Software Engineer

## Research Interests

Software quality, program analysis, software architecture, computer science education, Internet of things, music technology, network security

## Publications

2018	<i>Paramvir Singh</i> , Matthias Galster and Karanpreet Singh, "How do secondary studies in software engineering report automated searches? a preliminary analysis", 22 <sup>nd</sup> International Conference on Evaluation and Assessment in Software Engineering (EASE), Christchurch, New Zealand.
2018	Karanpreet Singh, <i>Paramvir Singh</i> and Krishan Saluja, "User behavior analytics-based classification of application layer HTTP-GET flood attacks", Journal of Network and Computer Applications, Elsevier, In Press.
2018	Shruti Aggarwal and <i>Paramvir Singh</i> , "Cuckoo, Bat and Krill Herd based k-means++ clustering algorithms", Cluster Computing Journal, Springer.
2018	Saurabh Tiwari, Deepti Ameta, <i>Paramvir Singh</i> and Ashish Sureka, "Teaching requirements engineering concepts using case-based learning: a case study", Workshop on Software Engineering Education for Millennials (SEEM) collocated with 40 <sup>th</sup> IEEE International Conference on Software Engineering (ICSE 2018), Gothenberg, Sweden.
2018	Shruti Aggarwal and <i>Paramvir Singh</i> , "Software fault prediction using hybrid swarm intelligent Cuckoo and Bat based k-means++ clustering technique", International Journal of Advanced Intelligence Paradigms, Inderscience.
2018	Saurabh Tiwari, Veena Saini, <i>Paramvir Singh</i> and Ashish Sureka, "A case study on the application of case-based learning in software testing", 11 <sup>th</sup> Innovations in Software Engineering Conference (ISEC), Hyderabad, India.
2017	Navdeep Singh and <i>Paramvir Singh</i> , "How do code refactoring activities impact software developers' sentiments? – an empirical investigation into GitHub commits", 24 <sup>th</sup> Asia-Pacific Softw. Engg. Conf. (APSEC), Nanjing, China.
2017	<i>Paramvir Singh</i> and Karanpreet Singh, "Exploring automatic search in digital libraries – a caution guide for systematic reviewers", 21 <sup>st</sup> International Conference on Evaluation and Assessment in Software Engineering (EASE), Karlskrona, Sweden.
2017	Veena Saini, <i>Paramvir Singh</i> and Ashish Sureka, "SEABED: an open-source software engineering case based

- learning database", 41<sup>st</sup> IEEE Computer Society Signature Conference on Computers, Software and Applications (COMPSAC), Turin, Italy.
- 2017 Sarishty Gupta and *Paramvir Singh*, "Comprehending scenario-level software evolution using calling context Trees", 16<sup>th</sup> International Conference on Information Technology (ICIT), to be held in Orissa, India.
- 2017 Amit Kumar dogra, Harkomal Singh and *Paramvir Singh*, "Execution trace streaming based real time collection of dynamic metrics using PaaS", 8<sup>th</sup> Workshop on Emerging Trends in Software Metrics (WETSoM) collocated with 39<sup>th</sup> IEEE Int'l Conf. on Software Engineering (ICSE), Buenos Aires, Argentina.
- 2017 Karanpreet Singh, *Paramvir Singh* and Krishan Saluja, "Application layer HTTP-GET flood DDoS attacks: Research Landscape and challenges", Computers and Security Journal (Elsevier), vol. 65, pp. 344-372.
- 2017 CM Kamalpriya and *Paramvir Singh*, "Enhancing program dependency graph based clone detection using approximate subgraph matching", 11<sup>th</sup> International Workshop on Software Clones (IWSC) collocated with Int'l Conference on Software Analysis, Evolution, and Reengineering (SANER), Klagenfurt, Austria.
- 2017 Prita and *Paramvir Singh*, "Comparative performance analysis of calling context profiling data structures", International Journal of Systems Assurance and Management (Springer), vol. 8, no. 1, pp. 135-150.
- 2017 Arvind Mahindru and *Paramvir Singh*, "Dynamic permissions based android malware detection using machine learning techniques", 10<sup>th</sup> Innovations in (Formerly India) Softw. Engg. Conf. (ISEC), Jaipur, India.
- 2016 Garima Dhaka and *Paramvir Singh*, "An empirical investigation into code smells elimination sequences for energy efficient software", 23<sup>rd</sup> Asia-Pacific Software Engineering Conference (APSEC), Hamilton, New Zealand.
- 2016 Aabha Choudhary and *Paramvir Singh*, "Minimizing refactoring effort through prioritization of classes based on historical, architectural and code smell information", International Workshop on Technical Debt Analytics (TDA) collocated with 23<sup>rd</sup> Asia-Pacific Software Engineering Conference (APSEC), Hamilton, New Zealand.
- 2016 Gurpreet Kaur and *Paramvir Singh*, "Validating software evolution of agile projects using Lehman's laws", International Conference on Computational Techniques in ICT (ICCICT), IPU, New Delhi, India.
- 2016 Monika and *Paramvir Singh*, "Modularizing software systems using PSO optimized hierarchical clustering", International Conference on Computational Techniques in ICT (ICCICT), IPU, New Delhi, India.
- 2016 Karanpreet Singh, *Paramvir Singh* and Krishan Kumar, "A systematic review of IP traceback schemes for denial of service attacks", Computers and Security Journal (Elsevier), vol. 56, pp. 111-139.
- 2016 Harpreet Singh and *Paramvir Singh*, "Enhancing AES using novel block key generation algorithm and key dependent S-boxes", Int'l Journal of Cyber-Security and Digital Forensics, vol. 5, no. 1, pp. 30-45.
- 2016 Karanpreet Singh, *Paramvir Singh* and Krishan Kumar, "Impact analysis of application layer DDoS attacks: A simulation study", Int'l Journal of Intelligent Engineering Informatics (Inderscience), vol. 5, no. 1, pp. 80-100.
- 2015 Kawal Jeet, Renu Dhir and *Paramvir Singh*, "Hybrid black hole algorithm for bi-criteria job scheduling on parallel machines", International Journal of Intelligent Systems and Applications, MECS Press, vol. 8, no. 4, pp. 1-17.
- 2015 Shallu Sarvari, *Paramvir Singh* and Geeta Sikka, "Efficient and scalable collection of dynamic metrics using map-reduce", 22<sup>nd</sup> Asia Pacific Software Engineering Conference (APSEC), New Delhi, India.
- 2014 Rani Geetika and *Paramvir Singh*, "Empirical investigation into static and dynamic coupling metrics", ACM SIGSOFT Software Engineering Notes, vol. 39, no. 01, pp. 1-8.
- 2014 Rani Geetika and *Paramvir Singh*, "Dynamic coupling metrics for object oriented software systems: A survey", ACM SIGSOFT Software Engineering Notes, vol. 39, no. 02, pp. 1-8.
- 2014 Shelza Kapur and *Paramvir Singh*, "Performance analysis of DCT based digital image watermarking using color spaces effects", International Journal of Computer Science and Engineering Technology, vol. 05, no. 06.
- 2010 *Paramvir Singh* and Hardeep Singh, "Class-level dynamic coupling metrics for static and dynamic analysis of object-oriented systems", International Journal of Information and Telecomm. Technology, vol. 01, no. 01.
- 2010 *Paramvir Singh* and Hardeep Singh, "Dynamic inheritance metrics for object-oriented systems", National Conference on Software Engineering (NCSOFT), Cochin, India.
- 2009 *Paramvir Singh* and Hardeep Singh, "Runtime coupling metrics for object-oriented software systems", Apeejay Journal of Management and Technology, vol. 04, no. 01.
- 2008 *Paramvir Singh* and Hardeep Singh, "DynaMetrics: A runtime metric-based analysis tool for object-oriented software systems", ACM SIGSOFT Software Engineering Notes, vol. 33, no. 06, pp. 1-6.
- 2008 *Paramvir Singh*, Geeta Sikka and Hardeep Singh, "Overview of runtime coupling and cohesion metrics for object-oriented software systems", Enterprise Information Systems in 21<sup>st</sup> Century, pp. 87-99, Deep and Deep Publications Pvt. Ltd.
- 2008 *Paramvir Singh*, "Towards defining semi-markov dynamic conditional random fields (semi-DCRFs)", Enterprise Information Systems in 21<sup>st</sup> Century, pp. 371-377, Deep and Deep Publications Pvt. Ltd.
- 2007 *Paramvir Singh* and Hardeep Singh, "Runtime coupling metrics at various levels of abstraction", Computer Society of India (CSI) Journal, vol. 37, no. 03.
- 2006 *Paramvir Singh*, "Theoretical comparison of probabilistic models applied to part-of-speech tagging", International Conference on Information Science Technology and Management (CISTM), CII, Chandigarh, India.
- 2006 *Paramvir Singh* and Gagandeep Jindal, "Overview of probabilistic models", National Conference on Information and Emerging Technologies (NCIET), Ropar, India.
- 2005 *Paramvir Singh* and Shailendra Singh, "Probabilistic models for segmentation and labeling tasks", Frontiers in

## Invited Talks

- 2018 Expert Talk on *What's Trending with University Courses on Software Engineering?* in the Workshop on Emerging Software Engineering Education collocated with Innovations in Software Engineering Conference (ISEC), IIIT Hyderabad, India.
- 2013 Expert Talk on *Software Engineering Research Directions* in TEQIP-II sponsored One-Week Short Term Course on Advances in Software Engineering and Knowledge based Systems held at NIT Jalandhar.

## Project Supervision

- PhD Thesis:** Supervised – 1  
(thesis submitted titled *Defending web services against application layer distributed denial of service attacks*)
- MTech Thesis:** Supervised – 31  
(selected list)
- 2017 An empirical investigation into the impact of code refactoring activities on software developers' sentiments  
*Navdeep Singh*
- 2017 Analyzing code smell removal sequences for enhanced software maintainability  
*Yukti Mehta*
- 2016 Execution trace streaming based scalable and real time collection of dynamic metrics using PaaS  
*Harkomal Singh*
- 2016 An empirical investigation into scenario level software evolution using calling context trees  
*Sarishty Gupta*
- 2016 An empirical investigation into code smells elimination sequences for energy efficient software  
*Garima Dhaka*
- 2016 Enhancing PDG based clone detection using approximate subgraph matching  
*C. M. Kamalpriya*
- 2016 Effective prioritization of classes for reduced refactoring effort  
*Aabha Choudhary*
- 2016 Improving Advanced Encryption Standard (AES) using a novel block key generation algorithm and dynamic s-boxes  
*Harpreet Singh*
- 2015 Efficient and scalable collection of dynamic metrics using Map-Reduce  
*Shallu Sarvari*
- 2015 Software clone detection using cosine distance similarity  
*Chavi Ralhan*
- 2015 Optimization of AODV protocol using enhanced DCF-MAC for IEEE 802.11g MANET  
*Bal Krishan*
- 2015 Model based test case generation using multi objective genetic algorithm  
*Gurpreet Kaur*
- 2015 Adaptive genetic approach to test case prioritization  
*Vandana Chahal*
- 2015 Validating software evolution of agile projects using Lehman laws  
*Gurpreet Kour*
- 2014 Packet size optimization with LDPC codes in wireless sensor networks  
*Daljit Singh*
- 2014 Optimization of search engine results based on implicit feedback comprising of user clicks and time spent data  
*Hawasingh Soni*
- 2014 Performance analysis of Java bytecode instrumentation libraries  
*Rohit Anand*
- 2014 Design and validation of aspect-oriented coupling metrics  
*Prerna Pandey*
- 2014  $\omega$ -Automation driven specification and verification of UML 2.0 sequence diagram  
*Azad*
- 2014 Comparative performance analysis of calling context profiling data structures  
*Prita Yadav*
- 2013 Dynamic coupling based behavioral analysis of object oriented systems  
*Rani Geetika*
- 2013 Diversity based performance analysis of wireless communication under Reyleigh and Rician fading for different modulation schemes

<b>BTech Major Projects:</b>	Supervised – 18
2017	Work management using location tracking <i>Shrawan Singh, Nandini Sarangal, Jai Singh, Manish Meena, Mandeep Singh</i>
2017	Stock price prediction and analysis <i>Vikash Khichar, Lalit Kumar, Manish Doodi, Ajay Devanda</i>
2016	Block summarization and sentiment analysis using Hadoop <i>Jeenat Parihar, Payal Agrawal, Tanu Choudhary, Mahima Choudhary</i>
2016	Automated attendance system using facial recognition <i>Ashok Bhukar, Dikshant, Hitesh Kumar Regar, Paras Miglani</i>
2016	Alumni portal Android application <i>Ankush Bansal, Manju, Sonam Sharma, Prachi Goel</i>
2015	Driving licence issuance application <i>Rahul Jindal, Shivam Sahu, Vinay Mattu</i>
2015	Image steganography software <i>Harmanpreet Singh, Mohit, Naveen Kumar, Shiv Handa</i>
2015	Software-oriented OMR system <i>Ravinder Singh, Ankit Kumar Singh, Himanshu Negi</i>
2015	Bluetooth proximity indicator <i>Ambuj Gandhi, Sahil Sethi, Samarth Batra</i>
2015	Ease access <i>Arvind Gupta, Likhita Singla, Atin Sikka</i>
2014	Online objective test <i>Harish Vishnoi, Satya Prakash Jaiswal</i>
2014	Ear and face based biometric system <i>Deepanshu, Kamal Bana, Sanjeev Kumar Pal</i>
2014	Telephone directory <i>Pooja Saawan Kapoor, Tarun Bansal, Sonia Jassal</i>
2014	Automatic subtitle generator for audio in videos <i>Ajaypal Singh, Jagarlamudi Venkatesh, Shaifi Bansal, Vadde Bala Krishna</i>
2013	GPU computation <i>Farhan Ahmad Khan, Dilip kumar Poddar</i>
2013	Route adviser app <i>Prashant Gandhi, Prem Kumar, Tayender Kumar</i>
2013	Classroom management system app based on Android <i>Maninder Singh, Jagdish Singh</i>
2013	Wireless home automation system <i>Rashik Kotwal, Rohitash Sarmal, Prashant Tamang</i>

## Subjects Taught

2017 - 2018	Agile Software Development (UG) Agile Software Engineering (PG) Advanced Programming Concepts in Java (UG)
2016 - 2017	Object Oriented Analysis and Design (PG) Computer Programming (UG) Statistical Methods for Research (PG) Agile Software Development (UG)
2015 - 2016	Software Engineering (UG) Object Oriented Analysis and Design (PG) Computer Programming (UG) Object Oriented Programming (UG) Advanced Data Structures and Algorithms (PG)
2014 - 2015	Software Engineering (UG) Object Oriented Analysis and Design (PG) Object Oriented Programming (UG) Advanced Data Structures and Algorithms (PG)
Before 2014	Software Quality Assurance (UG); Software Metrics and Quality Engineering (PG); Software Project Management (UG & PG); Software Testing Methodologies (UG); Object-Oriented Programming in Java (UG); Windows Programming in C/C++ (UG); Data Structures (UG); Formal Techniques to Software Reliability (PG); Web Technologies (UG); Object-Oriented Programming in C++ (UG); Symbolic Logic and Logic Processing (UG);

Electronic Commerce (UG); Formal Languages and Automata Theory (UG); Expert Systems (UG); Artificial Intelligence (UG); Programming Languages (UG)

### Courses Organized

- 2018 *Workshop on Emerging Software Engineering Education (WESEE)* collocated with Innovations in Software Engineering Conference (ISEC), to be held, Hyderabad, India. *Role: Organizer*
- 2016 A 10-day *Research-Teaching Exchange Excursion Workshop* co-organized by NIT Jalandhar and Technical University of Munich (TUM), Germany, at NIT Jalandhar. *Role: Coordinator*
- 2015 TEQIP-II sponsored One-Week *Short Term Course on Recent Trends in Software Engineering and Knowledge Mining* organized at NIT Jalandhar. *Role: Coordinator*
- 2014 TEQIP-II sponsored One-Week *Short Term Course on Data Analysis and Soft Computing* organized at NIT Jalandhar. *Role: Coordinator*
- 2013 TEQIP-II sponsored One-Week *Short Term Course on Advances in Software Engineering and Knowledge based Systems* organized at NIT Jalandhar. *Role: Coordinator*

### Courses Attended

- 2017 TEQIP-III sponsored *Faculty Development Programme on Cloud Computing and Internet of Things* held at NIT Jalandhar
- 2016 TEQIP-II sponsored *Short Term Course on Recent Advances in Image and Natural Language Processing* at NIT Jalandhar
- 2015 One Day *Workshop on Cloud Computing and Big Data Analytics* held at NIT Jalandhar
- 2014 TEQIP-II sponsored *Short Term Course on Recent Trends in Instrumentation and Control Engineering* held at NIT Jalandhar
- 2014 *Faculty Development Program on Agile Software Development* held at Infosys Chandigarh
- 2013 TEQIP-II sponsored *Short Term Course on Emerging Trends in Physics and Information Technology* held at NIT Jalandhar
- 2013 TEQIP-II sponsored *Faculty Development Programme on Recent Advances in Computer Networks and Information Security* held at NIT Jalandhar

### Research Dataset

- 2017 SentiRef – A dataset of refactoring-related developers' sentiments, <https://github.com/navdeep08/SentiRef>  
*Navdeep Singh, Paramvir Singh*
- 2016 Dynamic permissions dataset for Android applications, [http://www.pvsingh.com/a\\_mahindru](http://www.pvsingh.com/a_mahindru)  
*Arvind Mahindru, Paramvir Singh*

### Publicly Available Tools

- 2016 SEABED - Software Engineering Case Based Learning Database, <http://seabed.in>  
*Yukti Mehta, Paramvir Singh, Ashish Sureka and others*
- 2016 Dynamic Metrics Analysis Tool, <https://github.com/pv-singh/DMA>  
*Paramvir Singh, Harkomal Singh, Amit Kumar Dogra*

### Professional Service

- 2018 Guest Reviewer, Journal of Systems and Software, Elsevier
- 2018 PC Member, Conference on Software Engineering and Data Science (CoSEDS), University of Kashmir, India
- 2018 PC Member, 2<sup>nd</sup> Conference on Information and Communication Technology (CICT), IIIT Jabalpur, India
- 2018 PC Member, ICSE associated 1<sup>st</sup> International Workshop on Emerging Trends in Software Engineering for Blockchain (WETSEB 2018). Gothenberg, Sweden
- 2018 PC Member, SANER associated 1<sup>st</sup> International Workshop on Blockchain Oriented Software Engineering (IWBOSE 2018), Campobasso, Italy
- 2017 PC Member, Short Papers and Posters Track, 24<sup>th</sup> Asia-Pacific Software Engineering Conference (APSEC 2017), Nanjing, China
- 2017 Guest Reviewer, IET Software Magazine
- 2017 PC Member, ICSE associated 8<sup>th</sup> Workshop on Emerging Trends in Software Metrics (WETSoM 2017), Buenos Aires, Argentina
- 2017 Guest Reviewer, Journal of Brazilian Computer Society
- 2016 PC Member, ICSE associated 7<sup>th</sup> Workshop on Emerging Trends in Software Metrics (WETSoM 2016), Texas,

USA

2016

Team Lead, *Evening Interactive Training Sessions* under volunteer initiative titled *Build-up to Software Engineering Research* for UG and PG students of NIT Jalandhar and nearby Institutions

### Major Administrative Responsibilities

2017 – 2018	Warden, Mega Boys Hostel Block-F (Institute)
2013 – 2018	Coordinator, Communications (Institute)
2013 – 2018	Coordinator, MTech Full Time Programme (Department)
2016 – 2018	Counsellor, BTech (CSE) First Year (Department)
2013 – 2015	In-charge, Time Table (Department)
2013 – 2014	Nodal Officer, Foreign Student Registrations (Institute)

### Awards and Recognitions

2018	Bronze Partner Faculty – The Inspire Campus Connect Faculty Partnership Model, Infosys IT Services.
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### Professional Associations

- Member, The Institute of Electrical and Electronics Engineers (IEEE) and IEEE Computer Society, USA
- Life Member, The Indian Society for Technical Education (ISTE), New Delhi, India
- Member, The Institute of Engineers (India), Punjab, India

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**Declaration:** I certify that aforementioned information is correct and complete to the best of my knowledge and belief.

**Paramvir Singh**