

Curriculum Vitae: Karthik Pattabiraman

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Research Interests Error Resilient Systems, Compilers & Programming Languages, IoT Reliability & Security.

Education

PhD in Computer Science	University of Illinois (Urbana Champaign) <i>Advisor: Ravishankar K. Iyer</i>	May 2009
MS in Computer Science	University of Illinois (Urbana Champaign) <i>Advisor: Daniel A. Reed</i>	Dec 2004
B.Tech in Information Technology	University of Madras (Chennai, India)	Jul 2001

Work Experience (post PhD)

- Professor, Dept. of Electrical and Computer Engineer, Univ. of British Columbia, July 2020 - present.
- Associate Professor, Dept. of Electrical and Computer Engineering, Univ. of British Columbia, July 2015 - Jun 2020.
- Assistant Professor, Dept. of Electrical and Computer Engineering, Univ. of British Columbia, Jan 2010- Jun 2015.
- Post-Doctoral Researcher, Microsoft Research, Research in Software Engineering (RiSE) Group, Jan-Dec 2009.

Awards and Honors

- *Distinguished member* of the ACM, 2021. One of 63 members chosen world-wide that year.
- *Inaugural* Rising Star in Dependability award (RSD), 2020, awarded jointly by the IEEE Technical Committee on Fault Tolerant Computing (TC-FTC) and IFIP Working Group on Dependable Computing and Fault-tolerance.
- University of Illinois's (UIUC) Computer Science Department Distinguished Alumni Award – Early Career Educator Category, 2018.
- NSERC Discovery Accelerator Grant Supplement (DAS) Award for 2015-2018. One of 125 awarded across all fields of science and engineering out of more than 3000 applications in 2015 across Canada.
- Member of the IFIP WG 10.4 on Dependable Computing and Fault Tolerance (January 2015 onwards). I was also elected as the vice-chair in 2019 – one of two vice-chairs of the committee.
- Winner of the 2008 *William C. Carter* award sponsored by the IEEE Technical Committee on Fault-Tolerant Computing (TC-FTC) and the IFIP Working Group on Dependable Computing and Fault Tolerance (WG 10.4).
- Listed in the DSN conference hall of fame (top 15). DSN is the top conference in the area of dependable computing, and the hall of fame reflects the number of publications in the conference since 1988.
- UBC Killam award in 2020 for excellence in mentoring, to “*recognize faculty members’ outstanding ability to foster the intellectual, professional, and personal development of graduate students.*” - one of 2 awards across UBC.
- UBC Killam Faculty Research Prize, 2018 in the Sciences and Engineering category “*in recognition of outstanding research and scholarly contributions*” - one of 5 awardees in Science and Engineering across UBC (all ranks).
- Killam Research Fellowship at UBC for 2016. One of 10 awardees in Science and Engineering across UBC.

Students: I have graduated a total of 8 PhD students and 18 Master’s students, and am currently advising 12 students (7 PhD, 5 Masters) at UBC. Most of my students and post-docs have gone on to take up positions in academia (SFU, U. Iowa, ETS Montreal), national labs (PNNL), and industry (Microsoft, Google, SAP, Amazon etc.).

Awards won by my students

- My student Bo Fang (co-supervised with Matei Ripeanu) won the William C. Carter dissertation award in Dependability for 2020. His thesis also received an *honorable mention* at the SIGHPC dissertation award, 2020.
- My student Guanpeng Li received Standard Performance Evaluation Corporation (SPEC) Kaivalya Dixit Distinguished Dissertation award in 2019. One award is given each year.

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Selected Activities

- Program co-chair for DSN 2019, ISSRE 2017, and SRDS 2022 - these are the top venues in dependable computing.
- Co-founded Dependable and Secure Machine Learning (DSML) workshop at DSN in 2018 with 2 co-organizers. DSML is now in its fifth year, and had the largest attendance among all DSN workshops for the last three years
- Steering Committee Member for the DSN and PRDC conferences. Also, served as general chair for PRDC 2013.

Research Funding: I have obtained significant research funding from Canadian Government agencies such as the NSERC. I've also brought in industry grants for my research program totalling more than a million dollars since 2010.

Most Significant Publications (since 2011): Names of students and post-docs I have (co-)advised are **bolded**.

According to Google Scholar, my h-index=39 (https://scholar.google.ca/citations?user=p_V9YWgAAAAJ&hl=en)

- [1] *PID-Piper: Recovering Robotic Vehicles from Physical Attacks*, **Pritam Dash, Guanpeng Li, Zitao Chen, Mehdi Karimibiuki**, and Karthik Pattabiraman, Proceedings of the IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2021. (Acceptance Rate: 16.3%). **Best Paper Award (1 paper of 300 submissions)**.
- [2] *A Low Cost Fault Corrector for Deep Neural Networks through Range Restriction*, **Zitao Chen, Guanpeng Li**, and Karthik Pattabiraman, Proceedings of the IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2021. (Acceptance Rate: 16.3%). **Best Paper Award Runner up (1 of 2 papers from 300 submissions)**.
- [3] *Design-Level and Code-Level Security Analysis of IoT Devices*, **Farid Molazem Tabrizi** and Karthik Pattabiraman, ACM Transactions on Embedded Computing Systems (TECS). Accept date: January 2019. **Best Paper Award**.
- [4] *BinFI: An Efficient Fault Injector for Safety-Critical Machine Learning Systems*, **Zitao Chen, Guanpeng Li**, Karthik Pattabiraman, and Nathan DeBardeleben, Proceedings of the IEEE/ACM International Conference for High-Performance Computing, Storage and Networking (SC), 2019. (Acceptance Rate: 21%). **Finalist for SC 20 reproducibility challenge (one of three papers)**.
- [5] *Modeling Soft Error Propagation in Programs*, **Guanpeng Li**, Karthik Pattabiraman, Siva Hari, Michael Sullivan and Timothy Tsai, Proceedings of the IFIP/IEEE International Conference on Dependable Systems and Networks (DSN), 2018 (Acceptance rate for regular papers: 25%). **Best Paper Award Nominee (1 of 3)**.
- [6] *Understanding Error Propagation in Deep Learning Neural Network (DNN) Accelerators and Applications*, **Guanpeng Li**, Siva Hari, Michael Sullivan, Timothy Tsai, Karthik Pattabiraman, Steve Keckler, and Joel Emer, Proceedings of the International Conference for High-Performance Computing, Storage and Networking (SC), 2017. (Acceptance Rate: 19%). **First paper to investigate effects of errors on DNN accelerators (cited > 250 times)**.
- [7] *Failure Analysis of Jobs in Compute Clouds: A Google Cluster Case Study*, **Xin Chen**, Charng-da Lu and *Karthik Pattabiraman*, Proceedings of the 25th IEEE International Symposium on Software Reliability Engineering (ISSRE), 2014. (Acceptance rate: 25%). **Chosen as one of the "highlights of ISSRE" – one of 26 papers chosen from over 1000 papers in the 30 year history of the ISSRE conference (in 2019)**.
- [8] *Quantifying the Accuracy of High-Level Fault Injection Techniques for Hardware Faults*, **Jiesheng Wei, Anna Thomas, Guanpeng Li**, and *Karthik Pattabiraman*, Proceedings of the IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2014. (Acceptance Rate: 30%). **cited more than 100 times**.
- [9] *Understanding JavaScript Event-Based Interactions*, **Saba Alimadadi, Sheldon Sequira**, Ali Mesbah and Karthik Pattabiraman, Proceedings of the IEEE/ACM International Conference on Software Engineering (ICSE), 2014, Hyderabad, India (Acceptance Rate: 20%). **ACM SIGSOFT Distinguished Paper Award (9 of 500 submissions)**.
- [10] *Flicker: Saving DRAM Refresh-power through Critical Data Partitioning*, **Song Liu**, Karthik Pattabiraman, Thomas Moscibroda and Benjamin Zorn, Proceedings of the ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2011. (Acceptance Rate: 20%). **cited > 500 times**.