

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

- *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 7 students (5 PhD, 2 Masters) at UBC. Most of my students/post-docs have gone on to academia (SFU, U. Iowa, ETS Montreal), national labs (PNNL), and industry (Microsoft, Google, SAP, Amazon etc.). Many have won competitive fellowships such as the NSERC Postdoctoral fellowship (PDF) from the Canadian Government, and other fellowships at UBC.

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 - one of 2 co-chairs, and Program co-chair of ISSRE 2017 - one of 2 co-chairs.
- Co-founded DSML workshop series at DSN along with 2 co-organizers. DSML had the largest attendance for 3 years.
- Steering Committee Member for the IEEE Pacific Rim International Symposium on Dependable Computing (PRDC), 2015-2020. One of ten members of the Steering Committee. Also, served as general chair for PRDC 2013.
- Guest co-editor of a special issue of IEEE Transactions on Dependable and Secure Computing (TDSC), 2018 (one of three co-editors), and the IEEE Transactions on Reliability (TR), 2020 (one of two co-editors).
- Senior Member of the IEEE (since 2015), Senior member of the ACM (since 2019), and a member of the Usenix.

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 about 1 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=36 (https://scholar.google.ca/citations?user=p_V9YWgAAAAJ&hl=en)

- [1] *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**.
- [2] *BinFI: An Efficient Fault Injector for Safety-Critical Machine Learning Systems*, **Zitao Chen, Guanpeng Li**, Karthik Pattabiraman, and Nathan DeBardleben, 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)**.
- [3] *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)**.
- [4] *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 > 125 times)**.
- [5] *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)**.
- [6] *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**.
- [7] *GPU-Qin: A Methodology for Evaluating the Error Resilience of GPGPU Applications*, **Bo Fang**, Karthik Pattabiraman, Matei Ripeanu and Sudhanva Gurusurthi, Proceedings of the IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS), 2014. (Acceptance Rate: 30%). **cited > 100 times**.
- [8] *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)**.
- [9] *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**.