

Lei Zhang

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Department of Computer Science, Ryerson University, Toronto, ON, Canada

EDUCATION

PhD, Computer Science, McMaster University, Hamilton, ON, Canada, 2009 – 2015

Master's Degree, Computer Science, The University of Hong Kong, Hong Kong, 2006 – 2007

Bachelor's Degree, Computer Science, Zhejiang University, Hangzhou, China, 2000 – 2004

EMPLOYMENT HISTORY

Co-founder

Quarta Inc., Kingston, ON, Canada, 2020 – Present

Post-Doctoral Research Fellow

Computer Science, Ryerson University, Toronto, ON, Canada, 2017 – Present

Biomedical Software Engineer

Mariner Endosurgery Inc., Hamilton, ON, Canada, 2016 – 2017

Research Assistant

Computer Science, McMaster University, Hamilton, ON, Canada, 2009 – 2014

Software Engineer

Hong Kong Communication Technology Inc., Hong Kong, 2008 – 2009

Software Engineer

SIM Technology, Shanghai, China, 2006 – 2007

Software Engineer

Mitac Computer Ltd., Shanghai, China, 2004 – 2006

RESEARCH

- My current research interests lie in the intersections of software engineering and new emerging techniques, e.g., quantum computing, machine learning, and blockchain.
- I have authored 14 papers on software engineering and system modeling topics (listed on pages 6–7).
- I currently mentor 3 PhD students and 1 Master's student in the research group. In total, I have mentored 6 graduate students.
- I have been involved in 7 academic-industry collaborations (listed on page 5), resulting in 1 intellectual property, 3 open-source software, and 1 open dataset.

AWARDS & HONOURS

Distinguished Paper Award, The 42nd International Conference on Software Engineering, 2020

Faculty of Science Dean's Research Fund—Travel, \$1,340, Ryerson University, 2019

Engineering Graduate School Travel Award, \$500, McMaster University, 2015

Master's Degree Pass with Distinction, The University of Hong Kong, 2008

China Student Scholarship Award, \$30,000 (HKD), The University of Hong Kong, 2007

FELLOWSHIP & SCHOLARSHIP

Dean's Research Fund—Post-Doctoral Fellowship

Ryerson Faculty of Science and Department of Computer Science (PI: Andriy Miransky),
\$33,010, Ryerson University, 2021 – 2023

IBM CAS PDF Fellowship

IBM Center for Advanced Studies (CAS) Research: Making Existing Software Quantum-resistant
(PI: Andriy Miransky), \$34,000, Ryerson University, 2020 – 2021

Dean's Research Fund—Post-Doctoral Fellowship

Ryerson Faculty of Science and Department of Computer Science (PI: Andriy Miransky),
\$72,000, Ryerson University, 2018 – 2020

Researcher

Research Assistant Scholarship, \$10,000, McMaster University, 2013 – 2014

Researcher

Research Assistant Scholarship, \$100,000, McMaster University, 2009 – 2013

RESEARCH SERVICE

Project Coordinator/Researcher

NSERC CRD Grant: Improve Robustness and Transparency of Cloud Platforms (PI: Andriy
Miransky), \$188,000, Ryerson University, 2020 – 2022

Project Coordinator/Researcher

OCE VIP I: Regression Testing of Datasets (PI: Andriy Miransky), \$50,000, Ryerson University,
2018 – 2019

Project Coordinator/Researcher

OCE VIP I: Scalable Simulation for Management of Large and Dense Crowds (PI: Andriy
Miransky), \$50,000, Ryerson University, 2017 – 2018

TEACHING EXPERIENCE

Instructor

Computer Science / Electrical & Computer Engineering, Ryerson University, Toronto, Canada, 2019

- Undergraduate Course: Software Engineering (CPS888)
- Taught a group of 40 senior undergraduates
- Subjects: software lifecycle, software process, requirements engineering, system modeling, software design and structures, implementation, verification and validation, maintenance.

Guest Lecturer

Computer Science, Ryerson University, Toronto, Canada, 2021

- Graduate Course: Advanced Natural Language (CP8207/CP8315)
- Designed an online lecture for a cohort of 12 graduate students on the topic of information extraction, named-entity recognition, and relation extraction.

Guest Lecturer

Computer Science, Ryerson University, Toronto, Canada, 2019

- Graduate Course: Advanced Natural Language Processing (CP8309/CP8315)
- Designed a lecture for a cohort of 10 graduate students on the topic of named-entity recognition.

Guest Lecturer

Computer Science, Ryerson University, Toronto, Canada, 2019

- Undergraduate Course: Software Engineering (CPS731)
- Designed a lecture for a cohort of over 40 senior undergraduate students on the topic of software development in startups.

Guest Lecturer

Computer Science, Ryerson University, Toronto, Canada, 2019

- Graduate Course: Doctoral Seminar (CP9102)
- Designed a lecture for a cohort of 20 – 30 PhD students on the subjects of crowd management, modeling and simulation.

Teaching Assistant

Computer Science, Ryerson University, Toronto, Canada, 2018

- Graduate Course: Design of Algorithms and Programming for Massive Data (DS8001)
- Responsibilities: mark assignments and exams, proctor exams, mentor and advise a group of 30 – 40 Master's students.

Teaching Assistant

Computer Science, McMaster University, Hamilton, Canada, 2014

- Undergraduate Course: Real-Time Systems (ENG 4AA4/6GA3)
- Responsibilities: prepare and mark assignments, grade exams, mentor and advise a cohort of over 80 undergraduate students.

PROFESSIONAL DEVELOPMENT

University Teaching Development Program, Ryerson University, accredited by SEDA UK, 2020

Instructional Skills Workshop, Ryerson University, 2019

Professional Development in Teaching Program, Ryerson University, accredited by SEDA UK, 2018

PROFESSIONAL SERVICE

Reviewer. The Journal of Automated Software Engineering, 2021

Shadow Program Committee. The 2021 Mining Software Repositories (MSR), Online, 2021

Program Committee Member. The Second International Workshop on Quantum Software Engineering (Q-SE 2021), Online, 2021

Program Committee Member. The 2021 Conference of the North American Chapter of the Association for Computational Linguistics – Human Language Technologies (NAACL-HLT), Mexico City, Mexico, 2021

Review Committee Member. The 2020 Conference on Empirical Methods in Nature Language Processing (EMNLP), Online, 2020

Reviewer. The 58th Annual Conference of the Association for Computational Linguistics (ACL), Online, 2020

Reviewer. The 29th International Conference on Computer Science and Software Engineering (CASCON), Toronto, Canada, 2019

Reviewer. The Journal of Systems and Software, 2019

Reviewer. The 27th IEEE International Requirements Engineering Conference (RE), Jeju Island, South Korea, 2019

Reviewer. The 28th International Conference on Computer Science and Software Engineering (CASCON), Toronto, Canada, 2018

MENTORSHIP

Mentored graduate students, Ryerson University, Canada, 2017 – Present

- Mentor two PhD students in machine learning.
- Mentor one PhD student and one Master's student in natural language processing.
- Mentored one PhD student in crowd simulation.

Mentored graduate students, McMaster University, Canada, 2014

- Mentored one Master's student in software reliability analysis.

COLLABORATIONS

Quantum-resistant cryptography, Ryerson University and IBM Canada, 2020 – Present

- Research fellow in IBM Center for Advanced Studies (CAS), Canada.
- Monitor and document the progress, update team members, and track the paperwork.
- Implement a post-quantum cryptography for IBM Db2 software.

Tamper-proof log storage using blockchain, Ryerson University and IBM Canada, 2018 – Present

- Coordinate the work progress and track the paperwork.

Anomaly Detection for Time Series, Ryerson University and IBM Canada, 2017 – Present

- Communicate with team members and track the work progress.
- Implement a real-time anomaly detection framework based on deep neural networks for IBM cloud platforms.

Regression Testing for Big Datasets, Ryerson University and Environics Analytics, 2018 – 2019

- Developed an automated regression testing tool based on statistical methods for two datasets.

Crowd Simulation for Stampede Prediction, Ryerson University and Laipac Technology Inc., 2017 – 2018

- Coordinated project responsibilities with team members.
- Proposed a method based on crowd simulation to predict stampedes in large events.

Reliability Assessment for Safety-critical Software Systems, McMaster University and Ontario Power Generation, 2013 – 2014

- Developed a Bayesian estimation for nuclear shutdown software.

Performance Evaluation for Software Migration, McMaster University and Legacy System International, 2011 – 2013

- Implemented multiple performance evaluation methods based on queueing theory for computer systems.

PUBLICATIONS

Refereed Journal Publications

1. W. Pourmajidi, **L. Zhang**, J. Steinbacher, T. Erwin and A. Miranskyy, Immutable Log Storage as a Service on Private and Public Blockchains, *Transactions on Services Computing*, IEEE, 2021.
2. **L. Zhang**, A.V. Miranskyy and W. Rjaibi, Quantum Advantage and Y2K Bug: Comparison, *IEEE Software*, 38(2), IEEE, 2021.
3. **L. Zhang**, D. Lai and A.V. Miranskyy, The Impact of Position Errors on Crowd Simulation, *Simulation Modelling Practice and Theory*, 90(2019), Elsevier, 2019.
4. **L. Zhang** and D.G. Down, APEM - Approximate Performance Evaluation for Multi-core Computers, *Journal of Circuits, Systems, and Computers*, 28(1), World Scientific, 2018.

Refereed Book Chapters

5. W. Pourmajidi, **L. Zhang**, A. Miranskyy, T. Erwin, D. Godwin and J. Steinbacher, The Challenging Landscape of Cloud-Monitoring, accepted in the book of "*Knowledge Management in Development of Data-Intensive Systems*", 2020.
6. **L. Zhang** and D.G. Down, SMVA: A Stable Mean Value Analysis Algorithm for Closed Systems with Load-dependent Queues, Chapter 2, in the book of "*Systems Modeling: Methodologies and Tools*", Springer, 2018.

Refereed Conference Publications

7. J. Baskararajah, **L. Zhang**, A. Miranskyy, Term Interrelations and Trends in Software Engineering, in Proc. of the *ACM joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE)*, 2021.
8. M. S. Islam, W. Pourmajidi, **L. Zhang**, J. Steinbacher, T. Erwin and A. Miranskyy, Anomaly Detection in a Large-scale Cloud Platform, in Proc. of the *43rd International Conference on Software Engineering (ICSE)*, 2021.
9. A.V. Miranskyy, **L. Zhang** and J. Doliskani, Is Your Quantum Program Bug-Free? in Proc. of the *42nd International Conference on Software Engineering (ICSE)*, 2020. (**Distinguished Paper Awards**).
10. A.V. Miranskyy and **L. Zhang**, On Testing Quantum Programs, in Proc. of the *41st International Conference on Software Engineering (ICSE)*, 2019.
11. W. Pourmajidi, **L. Zhang**, J. Steinbacher, A.W. Erwin and A.V. Miranskyy, Immutable Log Storage as a Service, in Proc. of the *41st International Conference on Software Engineering (ICSE)*, 2019.
12. **L. Zhang** and D.G. Down, A Stable Mean Value Analysis Algorithm for Closed Systems with Load-dependent Queues, in Proc. of the *10th EAI International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS)*, 2016.
13. **L. Zhang** and D.G. Down, Approximate Mean Value Analysis for Multi-core Systems, in Proc. of the *International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS)*, 2015.

14. I. Al-Azzoni, **L. Zhang** and D.G. Down, Performance Evaluation for Software Migration, in *Proc. of the 2nd ACM/SPEC International Conference on Performance Engineering (ICPE)*, 2011.

Workshops and Posters

15. A. Miransky, **L. Zhang**, W. Rjaibi, G. Stager, J. Peck, Making Existing Software Quantum-Resistant, *Center for Advanced Studies Technical Link Event (CASTLE'20)*.
16. **L. Zhang**, Performance Evaluation for Multi-tier Cloud Applications, in *Workshop of Taming Services for IBM Cloud, Conference of the Center for Advanced Studies on Collaborative Research (CASCON'19)*.
17. W. Pourmajidi, **L. Zhang**, M. Islam, T. Erwin, J. Steinbacher, D. Godwin, J. Brumer, S. Woolf, A.V. Miransky, Dogfooding: Use IBM Cloud Services to Monitor IBM Cloud Infrastructure, *Conference of the Center for Advanced Studies on Collaborative Research (CASCON'19)* and *Center for Advanced Studies Technical Link Event (CASTLE'19)*.
18. W. Pourmajidi, **L. Zhang**, T. Erwin, J. Steinbacher, D. Godwin, A.V. Miransky, ROAD—Realtime Outlier and Anomaly Detection for IBM Cloud, *Conference of the Center for Advanced Studies on Collaborative Research (CASCON'18)* and *Center for Advanced Studies Technical Link Event (CASTLE'17)*.

Technical Reports

19. **L. Zhang**, I. Al-Azzoni and D.G. Down, PELE—An MVA-based Performance Evaluation Methodology for Computer System Migration. Technical Report, CAS-13-03-DD, McMaster University, 2013.

PhD Thesis

20. **L. Zhang**, Performance Models for Legacy System Migration and Multi-core Computers—an MVA Approach, McMaster University, 2015.

Submitted Manuscripts and Preprints

21. **L. Zhang**, A.V. Miransky, W. Rjaibi, G. Stager, M. Gray and J. Peck, Making Existing Software Quantum Safe: Lessons Learned, *ICSE'22*, 2021.
22. **L. Zhang**, S. Howard, T. Montpool, J. Moore, K. Mahajan and A.V. Miransky, Automated Data Validation: An Industrial Case Study, *Journal of Systems and Software*, Elsevier, 2021.
23. A. Miransky, **L. Zhang**, J. Doliskani, On Testing and Debugging Quantum Software, *Transactions on Software Engineering*, IEEE, 2021.
24. I. Sokalska, **L. Zhang**, Q. Hu and A. Miransky, CAR: Class Annotated Relationship Abstraction for Bug Localization, *preprint*, 2021.

CONFERENCE PRESENTATIONS

Presentation at ICSE'20, Korea (online), July, 2020

Presentation at IBM CASTLE'20, Canada (online), May, 2020

Poster Presentation at ICSE'19, Montreal, Canada, May, 2019

Poster Presentation at CASCON'18, Toronto, Canada, October, 2018

Workshop Presentation at IBM CASTLE'18, Toronto, Canada, May, 2018

Presentation at VALUETOOLS'16, Taormina, Italy, October, 2016

Presentation at SPECTS'15, Chicago, USA, July, 2015

INVITED TALKS

Invited Talk at Consortium for Software Engineering Research, Canada (online), May, 2021

Invited Talk at IBM Toronto Software Lab, Canada (online), August, 2020

Invited Talk at CASCON'19, Toronto, Canada, November, 2019

Invited Talk at Laipac Technology Inc., Toronto, Canada, November, 2017

Invited Talk at Huawei Canada Research Center, Toronto, Canada, July, 2015

INTELLECTUAL PROPERTY

- W. Pourmajidi, A.V. Miransky, **L. Zhang**, A. Erwin, D. Godwin, J. Steinbacher, Feedback-Based Automatic Anomaly Detection for Cloud Platforms, IPCOM 000260742D, (2019) (IP publication).

REFERENCES

[Provided on separate page]