Boqi (Percy) Chen

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Education

2021/01–2025 Montreal, Canada	**Doctor of Philosophy (PhD) – McGill University** in Software Engineering • Supervisors: **Gunter Mussbacher** and **Dániel Varró**. • Thesis title: *Domain-Driven and Consistent Integration of Large Language Models.* • **Expected defense date: *October 2025*.**
2016/09–2020/12 Montreal, Canada	**Bachelor of Software Engineering – McGill University** • GPA: **3.99**/4.0 (Dean's Honour List).

Research Experience

2025/05 – 2025/06 Halifax, Canada	**Visiting Researcher – Dalhousie University** • Visiting the Software Maintenance and Analytics Research Team (SMART) at the Faculty of Computer Science. • Supervisor: **Tushar Sharma** • Topic: *Non-functional Evaluation of Large Language Models for Software Design*
2023/10 Budapest, Hungary	**Visiting Researcher – Budapest University of Technology and Economics** • Visiting the Critical Systems Research Group (FTRSG) at the Department of Artificial Intelligence and Systems Engineering. • Supervisor: **Oszkár Semeráth** • Topic: *Certifying the Robustness of Graph Neural Networks using Abstract Interpretation Techniques*

Industrial Experience

2021/09 – present Toronto, Canada (part-time)	**Machine Learning Engineer – Aggregate Intellect** • Collaboration through a Mitacs Accelerate grant. • Supervisor: **Amir Feizpour** • Maintaining the open-source library *Sherpa AI* for orchestrating LLM agents with software models. • Designed a state machine-based framework for integrating domain-specific practices into LLMs. • Led the end-to-end development of multiple customized LLM-based applications addressing diverse client requirements.
2024/05 – 2025/04 Toronto, Canada (part-time)	**Research Associate Intern – Huawei Canada** • Research group: Intelligent Testing Lab at Huawei Waterloo Research Center. • Supervisors: **Ou Wei** and **Bingzhou Zheng** • Enhanced an LLM-based pipeline that transforms natural language requirements into testing models, substantially increasing production acceptance rates by over 20%. • Proposed and implemented a novel approach to provide guarantees on the consistency of LLM-generated models with domain-specific constraints. • Contributed to an internal tool to automatically evaluate the quality of LLM-generated models.

2018/05 – 2018/08 Montreal, Canada	**Game Developer Intern – Behaviour Interactive** • Participated in the development and maintenance of a mobile game in Unity. • Solved multiple platform-dependent bugs for iOS and Android legacy bugs. • Worked on the design and implementation of new game levels.

Teaching and Supervision

Teaching

2021/01–2024/12 Montreal, Canada	**Teaching Assistant – McGill University** • **ECSE 223 Model-Based Programming** (undergraduate, 6 times). • **ECSE 439/539 Software Language Engineering** (graduate, 2 times). • **ECSE 326 Software Requirements Engineering** (undergraduate, 2 times). • **ECSE 429 Software Validation** (undergraduate, 2 times). • Instructors: Gunter Mussbacher, Dániel Varró and Marwan Kanaan. • Duties: Teaching tutorials, grading assignments and examples, holding office hours, and preparing course project materials.
2022/11 Atlanta, Georgia (Online)	**Guest Lecturer – Georgia State University** • Course title: **Advanced Deep Learning Analytics**. • Instructor: Kulsoom Abdullah. • Talk title: Graph Neural Networks and Their Applications.
2017/09–2020/12 Montreal, Canada	**Course Mentor – McGill University** • **ECSE 223 Model-Based Programming** (undergraduate, 2 times). • **ECSE 321 Intro to Software Engineering** (undergraduate, 1 time). • **MATH 140 Calculus 1** (undergraduate, 1 time). • Instructors: Gunter Mussbacher, Dániel Varró and Sidney Trudeau. • Duties: Holding mentor sessions, answering questions, grading assignments, and developing an automated grading framework for course assignments.

Supervision

2024/09 – present Montreal, Canada	**Undergraduate Student Co-supervisor – McGill University** • Co-supervising an undergraduate student in a research project. • Project topic: *Improving LLM Code Generation with Model-Driven Techniques*.
2024/09 – 2025/04 Montreal, Canada	**Design Project Co-supervisor – McGill University** • Co-supervised a team of 4 undergraduate students in a design project. • Project topic: *Structured State Machine Modeling with Large Language Models*.
2022/09 – 2024/09 Montreal, Canada	**Master Student Mentor – McGill University** • Co-supervised 2 master students in their research projects and master's theses. • Project topic: *Automated Generation and Evaluation of Domain Models with Large Language Models*.

Academic Services

Organizing Committee Member

2025	**Model-Driven Requirements Engineering Workshop (MoDRE)**

Program Committee Member

2025	**Large Language Models for Software Engineering Workshop (LLM4SE)**
2024	**Int'l Conference on Model Driven Engineering Languages and Systems (MODELS)** Poster track

> **Large Language Models for Model-Driven Engineering Workshop (LLM4MDE)**

Reviewer

2025	>	**ACM Transactions on Software Engineering and Methodology (TOSEM)**
2024, 2025	>	**Information and Software Technology (IST)**
2024	>	**Software and Systems Modeling (SoSyM)**
2023	>	**Int'l Conference on Fundamental Approaches to Software Engineering (FASE)** Subreviewer

Student Volunteer

2022	>	**Int'l Conference on Model Driven Engineering Languages and Systems (MODELS)**

Awards

2025	>	**Bronze Medal in the ACM Student Research Competition** at the International Conference on Software Engineering (ICSE)
	>	**Graduate Research Enhancement and Travel Award** from McGill University
2023 – 2025	>	**Accelerate Award** from Mitacs
2022 – 2025	>	**FRQNT B2X Doctoral Scholarship** from Fonds de Recherche du Québec
2021 – 2024	>	**McGill Engineering Doctoral Award (MEDA)** from McGill University
2019	>	**Summer Undergraduate Research in Engineering Award** from McGill University
2018 – 2020	>	**McGill Engineering Faculty Award** from McGill University
2017 – 2020	>	**Dean's Honour List** from McGill University

Research Publications

Journal Articles

1. J. A. H. López, **B. Chen**, M. Saad, T. Sharma, and D. Varró, "On inter-dataset code duplication and data leakage in large language models," *IEEE Transactions on Software Engineering*, vol. 51, no. 1, pp. 192–205, 2025.

2. F. Khan, **B. Chen**, D. Varró, and S. McIntosh, "An empirical study of type-related defects in python projects," *IEEE Transactions on Software Engineering*, vol. 48, no. 8, pp. 3145–3158, 2021.

3. O. Semeráth, A. A. Babikian, **B. Chen**, *et al.*, "Automated generation of consistent, diverse and structurally realistic graph models," *Software and Systems Modeling*, vol. 20, no. 5, pp. 1713–1734, 2021.

Conference Proceedings

1. A. A. Babikian, **B. Chen**, and G. Mussbacher, "Exploring large language models for requirements on string values," in *2nd Workshop on Multi-disciplinary, Open, and integRatEd Requirements Engineering (MO2RE 2025), Ottawa, Canada, April 2025.*, IEEE, 2025.

2. **B. Chen**, "Consistent graph model generation with large language models," in *47th IEEE/ACM International Conference on Software Engineering: ICSE 2025 Companion Proceedings, Ottawa, Canada, April 27-May 3, 2025*, IEEE, 2025.

3. **B. Chen**, J. A. H. López, G. Mussbacher, and D. Varró, "The power of types: Exploring the impact of type checking on neural bug detection in dynamically typed languages," in *2025 IEEE/ACM 47th International Conference on Software Engineering (ICSE), Ottawa, Canada, April 27-May 3, 2025*, IEEE, 2025, pp. 625–625.

4. M. Saad, J. A. H. López, **B. Chen**, D. Varró, and T. Sharma, "An adaptive language-agnostic pruning method for greener language models for code," in *Proceedings of the 33rd ACM International Conference on the Foundations of Software Engineering, FSE 2025, Trondheim, Norway, June 23-27, 2025*, ACM, 2025.

5. *K. Chen, **B. Chen**, *Y. Yang, G. Mussbacher, and D. Varró, "Embedding-based automated assessment of domain models," in *Proceedings of the ACM/IEEE 27th International Conference on Model Driven Engineering Languages and Systems, MODELS Companion 2024, Linz, Austria, September 22-27, 2024*, ACM, 2024, pp. 87–94.

6. *Y. Yang, **B. Chen**, *K. Chen, G. Mussbacher, and D. Varró, "Multi-step iterative automated domain modeling with large language models," in *Proceedings of the ACM/IEEE 27th International Conference on Model Driven Engineering Languages and Systems, MODELS Companion 2024, Linz, Austria, September 22-27, 2024*, ACM, 2024, pp. 587–595.

7. **B. Chen**, *K. Chen, S. Hassani, *et al.*, "On the use of GPT-4 for creating goal models: An exploratory study," in *31st IEEE International Requirements Engineering Conference, RE 2023 - Workshops, Hannover, Germany, September 4-5, 2023*, IEEE, 2023, pp. 262–271.

8. **B. Chen**, F. Yi, and D. Varró, "Prompting or fine-tuning? A comparative study of large language models for taxonomy construction," in *ACM/IEEE International Conference on Model Driven Engineering Languages and Systems, MODELS 2023 Companion, Västerås, Sweden, October 1-6, 2023*, IEEE, 2023, pp. 588–596.

9. *K. Chen, *Y. Yang, **B. Chen**, J. A. H. López, G. Mussbacher, and D. Varró, "Automated domain modeling with large language models: A comparative study," in *26th ACM/IEEE International Conference on Model Driven Engineering Languages and Systems, MODELS 2023, Västerås, Sweden, October 1-6, 2023*, IEEE, 2023, pp. 162–172.

10. **B. Chen**, *K. Chen, *Y. Yang, *et al.*, "Towards improving the explainability of text-based information retrieval with knowledge graphs," in *The First Workshop on Trustworthy Learning on Graphs (TrustLOG-CIKM 2022), Atlanta, Georgia, USA, October 2022*, 2022.

11. **B. Chen**, K. Marussy, S. Pilarski, O. Semeráth, and D. Varró, "Consistent scene graph generation by constraint optimization," in *37th IEEE/ACM International Conference on Automated Software Engineering, ASE 2022, Rochester, MI, USA, October 10-14, 2022*, ACM, 2022, 25:1–25:13.

12. **B. Chen**, D. Havelock, C. Plante, M. Sukkarieh, O. Semeráth, and D. Varró, "Automated video game world map synthesis by model-based techniques," in *MODELS '20: ACM/IEEE 23rd International Conference on Model Driven Engineering Languages and Systems, Virtual Event, Canada, 18-23 October, 2020, Companion Proceedings*, ACM, 2020, 4:1–4:5.

Preprints

1. M. Saad, J. A. H. López, **B. Chen**, N. A. Ernst, D. Varró, and T. Sharma, "SENAI: towards software engineering native generative artificial intelligence," *arXiv preprint arXiv:2503.15282*, 2025.

2. **B. Chen**, K. Marussy, O. Semeráth, G. Mussbacher, and D. Varró, "Certifying robustness of graph convolutional networks for node perturbation with polyhedra abstract interpretation," *arXiv preprint arXiv:2405.08645*, 2024.

Students I have (co-)supervised during the project.