ROMINA MAHINPEI

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INTERESTS & SKILLS

Research Interests: High performance computing, human-centered AI, computer science education.

Programming Languages: Java, Python, C, C#, C++, SQL, MATLAB, Julia, TypeScript, JavaScript, Erlang.

Tools & Technologies: CUDA, TensorFlow, Semantic Kernel, Power BI, Azure Data Factory, Azure Synapse.

EDUCATION

M.S.E. in Computer Science **09/2024 – 05/2026**
Princeton University

B.Sc. in Honours Computer Science with a Mathematics Minor **09/2020 – 05/2024**
University of British Columbia (UBC) GPA: 4.0 / 4.0

- **Thesis**: *Mixed Precision Minimal Residual (MINRES) Method*. [pdf]
  - Investigated the potential of low precision arithmetic in being an effective and efficient preconditioner for the MINRES linear system solver.
  - **Advisor**: Dr. Chen Greif – Department of Computer Science.
- **Relevant Courses**: Advanced ML, Human-Centred AI, Parallel Computation, Operating Systems, Relational Databases, Numerical Computation & Approximation, Computational Optimization, Linear Algebra, Probability.

PUBLICATIONS

Romina Mahinpei*, Iris Xu*, Steven Wolfman, and Firas Moosvi. 2024. **A Generalized Framework for Describing Question Randomization**. In Proceedings of the 55th ACM Technical Symposium on Computer Science Education V. 2 (SIGCSE 2024). Association for Computing Machinery, New York, NY, USA, 1736-1737. [pdf]

** Both authors contributed equally to this work.*

RESEARCH EXPERIENCE

Undergraduate Research Assistant | Systopia Lab, UBC **02/2022 – 01/2023**
- Designed, implemented, and tested the Model Card package for Tribuo, Oracle's open-source Java ML library, to allow users to create partially automated documentation cards for various ML models.
- **Advisor**: Dr. Margo Seltzer – Department of Computer Science.

Undergraduate Research Assistant | Quantum Matter Institute, UBC **05/2021 – 08/2021**
- Created heterostructures for collecting longitudinal resistance measurements and automated the visualization and categorization of those measurements using IgorPro.
- **Advisor**: Dr. Joshua Folk – Department of Physics.

Undergraduate Research Assistant | Undergraduate Research Opportunities, UBC **10/2020 – 03/2021**
- Coded a Python implementation of a recent deterministic model of weight loss and analyzed the simulated data to investigate the effects of restricted caloric intakes on body weight.
- **Advisor**: Dr. Leah Edelstein-Keshet – Department of Mathematics.

TEACHING EXPERIENCE

CPSC 313 – Hardware & Operating Systems | UBC **09/2023 – 04/2024**
- Held weekly tutorials and implemented online assessment questions on the PrairieLearn platform.

CPSC 210 – Software Construction & Development | UBC **09/2022 – 04/2023**
- Held weekly labs, hosted weekly office hours, and graded midterms and final exams.

Science One – Differential & Integral Calculus | UBC **09/2021 – 04/2022**
- Held review sessions, hosted weekly office hours, and graded midterms and final exams.

Work Experience

Software Engineering Intern | Xbox, Microsoft **06/2024 – 08/2024**
- Implemented new Semantic Kernel plugins for an AI Copilot operated by one of Xbox's experimentation teams.
- Defined and implemented success metrics for evaluating the response quality of the AI Copilot.

Software Engineering Intern | Xbox, Microsoft **06/2023 – 08/2023**
- Defined new metrics to track the availability of core streams owned by one of Xbox's data engineering team.
- Implemented the backend infrastructure, the data pipelines, and the Power BI report to summarize and visualize the defined metrics.

Software Engineering & Product Management (Explore) Intern | Xbox, Microsoft **06/2022 – 08/2022**
- Defined a new feature aimed at improving the user experience and conducted a user study to collect feedback.
- Implemented and tested the data model, the backend infrastructure, and the API supporting the new feature.

Highlighted Projects

A Generalized Framework for Describing Question Randomization [pdf]
- Introduced a randomization framework with six distinct levels to address the limitations in describing the diversity of question randomization in computer-based assessments.
- Complemented the framework with practical guides, including a decision tree and a usage table, to assist educators in effectively using the randomization framework.

Low Precision Training of Deep Learning Models [pdf]
- Investigated the impact of four general low precision schemes on the training time and classification accuracy of four different deep learning models from the domains of image and text classification.
- Implemented multi-precision and mixed-precision schemes of the selected models using TensorFlow and made measurements on Google Colab's Tesla T4 GPU to examine the trade-offs between speed and accuracy.

Personalized Practice Quizzes [pdf]
- Implemented six different collaborative filtering (CF) models using the Surprise SciPy Toolkit and trained the models to predict student performance scores on new questions based on past performance scores.
- Evaluated the suitability of these CF models in predicting performance scores on new questions, with these scores then being used to create a personalized set of practice questions.

Highlighted Awards

Academic Award of Excellence | Department of Computer Science, UBC **2024**
- Awarded to the student with the highest graduating average of the B.Sc. in Honours Computer Science.

Markus Meister Memorial Prize | Department of Computer Science, UBC **2024**
- Awarded to the graduating student with the highest standing in the final year of the B.Sc. in Computer Science.

Trek Excellence Scholarship for Continuing Students | UBC **2021, 2022, 2023**
- Awarded yearly to domestic undergraduate students in the top 5% of their year, faculty, and school.

Schulich Leader Scholarship | The Schulich Foundation **2020**
- Four-year undergraduate STEM scholarship awarded every year to a total of 100 Canadian students based on academic performance, leadership potential, and community involvement.

Last Updated: July 2024.