

# Curtis Fox

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CONTACT      Email: [curtfox@student.ubc.ca](mailto:curtfox@student.ubc.ca)  
INFORMATION   Google Scholar: [\[Link\]](#)  
Website: [\[Link\]](#)

EDUCATION      **University of British Columbia**  
Doctor of Philosophy (PhD) in Computer Science *2023 - Present*

- Research Area: Machine Learning
- Supervisor: Mark Schmidt

  
Master of Science (MSc) in Computer Science *2021 - 2023*

- Research Area: Machine Learning
- Supervisor: Mark Schmidt
- Thesis: A Study of the Edge of Stability in Deep Learning

  
Bachelor of Science (BSc) *2014 - 2019*

- Major: Combined Honours in Computer Science and Statistics

PAPERS

1. **Fox, C**; Schmidt, M. “Glocal Smoothness: Line Search can really help!”. *NeurIPS OPT Workshop*, 2024 [\[Link\]](#)
2. **Fox, C\***; Galli, L\*; Schmidt, M; Rauhut, H. “Nonmonotone Line Searches Operate at the Edge of Stability”. *NeurIPS OPT Workshop*, 2024 [\[Link\]](#)
3. Madden, L; **Fox, C**; Thrampoulidis, C. “Upper and lower memory capacity bounds of transformers for next-token prediction”. *arXiv preprint arXiv:2405.13718*, 2024 [\[Link\]](#)
4. **Fox, C**. “A Study of the Edge of Stability in Deep Learning”. *Master’s Thesis*, 2023 [\[Link\]](#)
5. Maslova, A; Ramirez, R; Ma, K; Schmutz, H; Wang, C; **Fox, C**; Ng, B; Benoist, C; Mostafavi, S; The Immunological Genome Project. “Deep Learning of Immune Cell Differentiation”. *Proceedings of the National Academy of Sciences of the United States of America*, 2020 [\[Link\]](#)
6. **Fox, C**; Supervisors: Sun, Y; Friedlander, M. “Truncated Interior Point Method for LP-Boost”. *Technical Report*, 2018 [\[Link\]](#)

\*Equal Contribution

RESEARCH      **Graduate Research Assistant**  
EXPERIENCE   University of British Columbia - Computer Science *May 2022 - Present*

- Research has focused on optimization for machine learning, both for deep neural networks and convex optimization tasks
- Worked on two projects involving the use of line searches in optimization for machine learning, leading to the papers [1] and [2] above
- Explored transformer models and their use in next-token prediction language tasks, discussed in paper [3] above
- Wrote master’s thesis on the Edge of Stability phenomenon in deep learning

**NSERC Undergraduate Research Assistant**

University of British Columbia - Statistics

*May 2019 - Aug 2019*

- Conducted research in using convolutional neural networks to extract biologically significant base-pair sequences from genomic data, leading to the paper [5] above

**NSERC Undergraduate Research Assistant**

University of British Columbia - Computer Science

*May 2018 - Aug 2018*

- Conducted research into boosting algorithms, summarized in the technical report [6] above

**TEACHING  
EXPERIENCE****Teaching Assistant**

University of British Columbia - Graduate TA

*2021 - present*

University of British Columbia - Undergraduate TA

*2015 - 2019*

I have worked as a TA for the following courses:

1. CPSC 110 - Computation, Programs, and Programming
2. CPSC 213 - Introduction to Computer Systems
3. CPSC 221 - Basic Algorithms and Data Structures
4. CPSC 302 - Numerical Computation for Algebraic Problems
5. CPSC 340 - Machine Learning and Data Mining
6. CPSC 406 - Computational Optimization
7. CPSC 421 - Introduction to Theory of Computing
8. STAT 200 - Elementary Statistics for Applications
9. STAT 302 - Introduction to Probability

**WORK****EXPERIENCE****Software Developer**

Synic Software

*2020 - 2021***SELECTED  
SKILLS****Programming Languages:** Python, MATLAB, Java, Bash**Packages/Tools:** PyTorch, NumPy, Matplotlib, Weights and Biases**AWARDS AND  
HONOURS****Graduate Teaching Assistant Award**

University of British Columbia

*2024*

- Graduate teaching assistant award given by UBC Computer Science department

**NSERC Undergraduate Student Research Award (\$4500)**

University of British Columbia

*2019*

- Government research funding for undergraduate research position

**NSERC Undergraduate Student Research Award (\$4500)**

University of British Columbia

*2018*

- Government research funding for undergraduate research position

**Trek Excellence (\$1500)**

University of British Columbia

*2015*

- Awarded for being in the top 5% of the undergraduate year, faculty, and school

## ACTIVITIES

### **UBC Computer Science Graduate and Recruiting Admissions Committee**

- Reviewed graduate school applications for the Computer Science Department

### **Machine Learning Research Group**

- UBC research group led by Dr. Mark Schmidt
- Presented research papers in machine learning and attended various talks

### **Convex Optimization Research Group**

- UBC research group led by Dr. Michael Friedlander
- Attended meetings with faculty and graduate students involving discussion and presentations of computational optimization problems