

SUMMARY

Ph.D. Candidate in Computing Science at the University of Alberta specializing in machine learning for sequential decision making, search, planning, and reinforcement learning. Published at ICML and AAAI, with experience developing learning-guided algorithms and high-performance research systems in C++, Python, and PyTorch.

TECHNICAL SKILLS

- **Programming Languages:** C++, Python, C, Java
- **Frameworks:** PyTorch, LibTorch, CUDA
- **Core Areas:** Machine Learning, Reinforcement Learning, Search & Planning, Sequential Decision Making

EDUCATION

- Ph.D. in Computing Science** — University of Alberta Expected July 2026
- **Thesis:** Learning-Based Search Control for Policy Tree Search
 - **Supervisors:** Michael Buro, Levi Lelis
 - **Research Area:** Learning policies for tree search and reinforcement learning methods under sparse rewards
 - Transferred directly from the M.Sc. program into the Ph.D. program.
- B.Sc. in Computer Science & Mathematics** – Wilfrid Laurier University 2017
- Faculty of Science Dean’s Honour Roll

PUBLICATIONS

- [1] **J. Tuero**, M. Buro, L. Orseau, and L. H. S. Lelis, “Structure-Induced Information for Rerooting Levin Tree Search”, in *International Conference on Machine Learning (ICML)*, 2026.
- [2] **J. Tuero**, M. Buro, and L. H. S. Lelis, “Subgoal-Guided Policy Heuristic Search with Learned Subgoals”, in *International Conference on Machine Learning (ICML)*, 2025.
- [3] J. He, R. N. Makarov, **J. Tuero**, and Z. Wang, “Performance Evaluation Metric for Statistical Learning Trading Strategies”, *Data Science in Finance and Economics*, vol. 4, no. 4, p. 570, 2024.
- [4] **J. Tuero** and M. Buro, “Bayes DistNet - A Robust Neural Network for Algorithm Runtime Distribution Predictions”, in *AAAI Conference on Artificial Intelligence (AAAI)*, 2021.
- [5] A. M. Hamel, C. T. Hoàng, and **J. Tuero**, “Chromatic Symmetric Functions and H-Free Graphs”, *Graphs and Combinatorics*, vol. 35, no. 4, pp. 815–825, 2019.

INVITED TALKS

1. “Learning to Generate Optimal Paths using Search-Aware Models”, *AIIDE-21 Workshop on Artificial Intelligence for Strategy Games*, Edmonton, Canada, Oct 11 2021.
2. “INSYN: Recommendation Models for Syntactically Incorrect Source Code”, *ATB Financial*, Edmonton, Canada, Jan 31 2019.

DEPARTMENTAL SEMINARS

1. “Learning-Based Search Control for Policy Tree Search”, Edmonton, Canada, July 13, 2026.
2. “Subgoal-Guided Policy Heuristic Search with Learned Subgoals”, Edmonton, Canada, August 08, 2025.
3. “Bayes DistNet - A Robust Neural Network for Algorithm Runtime Distribution Predictions”, Edmonton, Canada, May 19, 2022.

RESEARCH EXPERIENCE

- University of Alberta** 2018 – 2026
- Ph.D. Research Edmonton, AB
- Researched and implemented learning-guided methods for search and planning in sparse-feedback sequential decision-making problems.
 - Designed subgoal-guided policy tree search methods that improved sample efficiency in complex domains where prior approaches struggled due to computational cost [2].
 - Introduced rerooting-based search methods that allocate effort using lightweight structural signals, improving the speed and scalability of policy tree search without explicit subgoal generation [1].
 - Modeled algorithm runtime distributions with Bayesian methods, improving performance in low-data settings and under censored observations [4].

Wilfrid Laurier University
Undergraduate Research Assistant

2018
Waterloo, ON

- Contributed to early NLP/data preprocessing and statistical learning model design for predicting stock-return movements from financial-news headlines.
- Contributions supported a peer-reviewed study evaluating logistic regression, LASSO, and SVM models for news-based stock-return classification and trading-strategy assessment [3].

Wilfrid Laurier University
NSERC Undergraduate Research Assistant

2017
Waterloo, ON

- Helped prove cases in a classification of when chromatic symmetric functions of claw-free H -free graphs are e -positive.
- Co-authored a publication resolving most cases for $H = \{\text{claw}, F\}$ -free graphs, where F is a four-vertex graph [5].

ACADEMIC TEACHING POSITIONS

University of Alberta
Principal Instructor

2022 & 2024
Edmonton, AB

- Designed and delivered lectures, assignments, and assessments for an upper-year undergraduate course covering C++ programming, game AI, and RTS game engine internals.
- Led labs and tutorials, graded assignments and exams, held office hours, and supported instruction across undergraduate computing science courses.

University of Alberta
Graduate Teaching Assistant

2018 – 2026
Edmonton, AB

- Responsible for facilitating and carrying out labs, course material, exams, and assignments.
- Introduction to the Foundations of Computation II; Practical Programming Methodology in C; Advanced Game Programming in C++; Computational Cryptography; Search Knowledge and Simulations.

Wilfrid Laurier University
Undergraduate Teaching Assistant

2017 – 2018
Waterloo, ON

- Responsible for facilitating and carrying out labs, course material, exams, and assignments.
- Data Structures I; Introduction to Microprocessors; Algorithm Design and Analysis I.

PROFESSIONAL EXPERIENCE

AI4Good Lab
Teaching Assistant, Mentor

2021 – 2025
Edmonton, AB

- Prepared and delivered machine learning instructional material and mentored project teams in a national ML training program for women and gender diverse people across Canada.

CGI
Technical Analyst, Java Developer

2018
Markham, ON

- Backend development on a Java Spring Boot dashboard for financial institutions

RESEARCH SOFTWARE

- **libpolicyts** (C++): Built a modern C++23 library for policy tree search algorithms and supporting research utilities, designed for reusable experimentation and high-performance search workloads.
- **muzero-cpp** (C++): Implemented MuZero using Libtorch, with multi-threaded asynchronous actor inference, complex action representations, and efficient batched GPU inference.
- **Stones n Gems** (C++): Contributed the Stones n Gems environment to DeepMind's OpenSpiel framework, providing a complex domain for reinforcement learning and search research.

SELECTED TECHNICAL PROJECTS

- **tinytensor** (C++): Developed a tensor and automatic differentiation library with CUDA acceleration, including efficient implementations of core neural network layers and optimizers to better understand ML systems performance bottlenecks.