Aram Ebtekar
aramebtech@gmail.com

<div align="right">Computer Scientist</div>

Profile

- Interested in: algorithms, AI, machine learning, causal inference, decision/game theory, information theory, epistemology, neuroscience, linguistics, game design and education
- Enjoy bridging theoretical tools, exploring novel approaches, and collaborating to turn visions into reality
- World-class performance record in algorithmic computing competitions
- Some of my recent work can be seen at github.com/EbTech
- Mainly program in C++, Java, Python or GameMaker:Studio; also a fan of Rust
- Canadian citizen fluent in English, French and Farsi; elementary knowledge of Spanish, Mandarin, Japanese

Education

Carnegie Mellon University

2012 – 2016
- Ph.D. candidate in Computer Science (incomplete, leaving with M.S.)
- Research is described in the next section; preprints will be uploaded soon
- Teaching Assistant for 15-451/651 (Algorithms) taught by Avrim Blum and Anupam Gupta
- Attended the 2012 Summer School in Algorithmic Economics
- NSERC Alexander Graham Bell Canada Graduate Scholarship
- Memberships: Graduate Student Assembly departmental representative, Ballroom Dance Club, School of Computer Science musical performances

University of British Columbia

2008 – 2012
- B.Sc. Combined Honours in Computer Science and Mathematics with Distinction
- 92% (A+) GPA, Dean's Honour List and Science Scholar standing
- President's Entrance Scholarship (top level), Trek Excellence Scholarship, CPSC Scholarship
- 8-month software engineering internship at Electronic Arts, working on Need For Speed: World

Research and Personal Projects

2015
- **Elo-R rating system**: derived a Bayesian model and implemented a simple rating system for competitions in which the outcome is a total ordering among players, proposed as an improvement over the existing rating systems used in online programming competitions

2015
- **Cooperative multi-agent planning**: proved NP-hardness of planning with very simple constraints on visitation order, then proposed two heuristic search algorithms to handle a more general set of constraints with guarantees on the suboptimality factor of the path length; advised by Prof. Maxim Likhachev

2014
- **Parallel A* framework**: developed a theoretical framework that generalizes A* search; applications include anytime dynamic multi-heuristic or multi-processor search; advised by Prof. Maxim Likhachev

2013
- **Dynamic Łukasiewicz Game Logic**: generalized hybrid games with binary outcomes to a formal specification of zero-sum hybrid games with extended real outcomes, and derived its sequent calculus for semi-automated theorem proving; advised by Prof. André Platzer

2012
- **Deep learning for audio deconvolution**: for a team course project, studied Stacked Auto-Encoders and Deep Belief Networks and applied them to deconvolve filtered audio

Research and Personal Projects (continued)

2012
- **Linking population dynamics**: proposed a new population model to represent social interactions in the context of natural selection; theoretical and experimental analyses found the emergence of a nontrivial form of cooperation in scenarios resembling the Prisoner's Dilemma

2012
- **U! Robot!:** lead programmer in a team of 8 developers, completing a platformer game that was showcased at the end of the 48-hour Global Game Jam

2011
- **Equitable clustering:** derived an approximation algorithm for quantizing distributions on Euclidean space, with applications to image stippling; advised by Profs. David Kirkpatrick and William Evans

2011
- **AIspace.org contributions:** developed practice exercises and sample solutions to reinforce key concepts for students in undergraduate artificial intelligence courses

2008
- **Cybersword Duels**: a pair of sword-duelling video game engines, one in 2D and one in 3D, that map mouse movements intuitively into fully controllable sword motions, with collision physics

Contest Achievements

2015
- **57th place** in the TopCoder Open Algorithm Competition

2015
- **61st place** among over 50,000 registrants in the Google Code Jam

2015
- Achieved Codeforces **Grandmaster** title, peak rating 2400+ on both Codeforces and TopCoder

2012
- **18th place** in the **ACM ICPC World Finals** in Warsaw, Poland

2011
- Top 250, Team Honorable Mention in the William Lowell Putnam Mathematical Competition

2010 – 2011
- Member of the UBC Thunderbots, which placed **9th** in the **RoboCup** SSL international robot soccer competition; I developed some AI algorithms, e.g. filters for ball and robot tracking

Sample Coursework (grad-level marked with *)

Math
- Statistical Inference*; Evolutionary Dynamics*; Number Theory*; Intro Topology; Advanced Linear Algebra; Mechanics; Algebra, Coding Theory and Cryptography

Theory
- Computational Complexity Theory*; Type Systems for Programming Languages*; Advanced Algorithm Design and Analysis; Graph Theory; Functional and Logic Programming

AI
- Statistical Machine Learning*; Multimedia Databases and Data Mining*; Kinematics, Dynamic Systems and Control*; Intelligent Systems

Misc
- Advanced Distributed Operating Systems*; RPG Writing Workshop*; Computer Graphics

Audits
- Adaptive Control & Reinforcement Learning*; Planning, Execution & Learning*; String Algorithms*; Information Theory*; Design Educational Games*; Experimental Game Design; Intro Neuroscience

Volunteering

2015
- **ACM ICPC problem setter:** authored the problems J,L,N in the Pacific Northwest regional programming contest, and helped with additional writing/reviewing/testing; our aim is to raise the bar for programming contest quality in North America, for experts and novices alike

2013, 2015
- **FIRST Lego League research judge:** judged and gave feedback on research project presentations by teams of children aged 9-14 aimed at solving global issues using STEM principles

2006
- **Science AL!VE summer camp assistant:** helped run activities to encourage scientific curiosity in young children

References

Avrim Blum:
- Professor of Computer Science at Carnegie Mellon University, avrim@cs.cmu.edu

Daniel Sleator:
- Professor of Computer Science at Carnegie Mellon University, sleator@cs.cmu.edu

Maxim Likhachev:
- Research Assistant Professor at CMU Robotics Institute, maxim@cs.cmu.edu