Christine Konicki

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Research Interests

Empirical Game Theory, Multi-agent Systems, Game Theory, Reinforcement Learning, Computational Complexity, Artificial Intelligence, Computational Social Choice

Education

University of Michigan-Ann Arbor
Ann Arbor, MI
PhD Candidate in Computer Science and Engineering
2019 - present
  – Candidate since: August 2021
  – Expected graduation: June 2024
  – Thesis Supervisor: Michael Wellman
  – Committee: Mithun Chakraborty, Greg Bodwin, Grant Schoenebeck
  – GPA: 3.8/4.0

Massachusetts Institute of Technology (MIT)
Cambridge, MA
MEng in Electrical Engineering and Computer Science
2017 - 2019
  – Thesis Supervisor: Virginia Williams
  – GPA: 4.8/5.0

Massachusetts Institute of Technology (MIT)
Cambridge, MA
BS in Electrical Engineering and Computer Science
2013 - 2017
  – GPA: 4.3/5.0

Relevant Coursework

University of Michigan
Advanced Mechanism Design; Machine Learning; Advanced Artificial Intelligence; Electronic Commerce; Computer and Network Security; Advanced Topics in Computer Vision

MIT
Algorithmic Game Theory; Theory of Computation; Advanced Complexity Theory; Cryptography and Cryptanalysis; Introduction to Algorithms; Computation Structures; Probabilistic Models and Applied Probability; Discrete Mathematics; Network Science and Models; Advanced Bayesian Modeling and Inference; Microcomputer Project Lab; Software Construction

Research Experience

PhD Research at UM-Ann Arbor
Ann Arbor, MI
Graduate Student Researcher
Fall 2019 - present

  – Researching the application of empirical game-theoretic analysis (EGTA) to extensive-form games
  – Designed a model that uniquely exploits the present tree structure instead of converting to normal-form/matrix-form, leading to improvements in payoff estimation and strategy exploration
  – Exploring the extension of empirical game-theoretic analysis to handle/compute refined Nash solution concepts unique to extensive-form games

MIT CSAIL Cambridge, MA
Graduate Student Researcher 2017 - 2019

- Applied computational complexity to the rigging of balanced knockout tournaments
- Developed a more efficient FPT algorithm for finding a winning seeding
- Investigated the separate and combined effects of tournament organizers bribing players and strong players "choking under pressure" on the selection of a winning seeding

Teaching Experience

EECS 592: Foundations of Artificial Intelligence Ann Arbor, MI
Graduate Student Instructor Winter 2023

- Taught students fundamental AI concepts such as search algorithms, optimization, machine learning, probability, and real-world task environment formulation
- Graded, proctored, and designed exams
- Collaborated with instructor in designing monthly problem sets
- Led discussion sections once a week for class of 50 students
- Attended weekly staff meetings

Summer STEM Institute Ann Arbor, MI (Remote)
Teaching Fellow Summer 2021

- Guided high school students with no coding/AI experience in writing/debugging Python code, basic machine learning, and discrete probability over intense 4 week program
- Hosted daily office hours over Zoom for students
- Collaborated with other teaching fellows to guide and help students with homework
- Attended daily staff meetings

MIT Women's Technology Program in EECS Cambridge, MA
Computer Science Instructor Summer 2019

- Taught students with no coding experience how to write, design, and debug Python code; successful students created a fully functional game of Tetris after 3 weeks
- Designed and led lectures every day for 2 classes of 20 students
- Designed and graded problem sets consisting in part of small software projects (e.g. Minesweeper, Hangman, Tic Tac Toe, Concentration, and simple object animation)
- Supervised and collaborated with 5 residential tutors/TAs to guide and help students with homework
- Attended daily staff meetings

6.041: Probabilistic Systems Analysis and Applied Probability Cambridge, MA
Graduate Teaching Assistant (TA) Spring 2019

- Taught fundamental concepts in probability and inference such as basic probability, random variables, Bayesian inference, continuous/discrete distributions, stochastic processes, and limit theorems
- Graded, proctored, and designed exams
- Collaborated with staff in designing biweekly problem sets
- Led tutorials once a week
- Attended weekly staff meetings

6.009: Fundamentals of Programming

Cambridge, MA

Graduate Teaching Assistant (TA)

Fall 2018

- Guided students in writing and debugging clean Python code for assigned software labs (e.g. a symbolic algebra parser, a solver for Boolean SAT, a LISP interpreter)
- Taught fundamental concepts in software and algorithms such as recursion, object-oriented design, sockets, and Python-centric conventions for efficiency
- Led four 3-hour sessions of lab/office hours every week
- Graded, proctored, and designed exams
- Attended weekly staff meetings

6.004: Computation Structures

Cambridge, MA

Graduate Teaching Assistant (TA)

Fall 2017 - Spring 2018

Undergraduate Lab Assistant (LA)

Fall 2015 - Spring 2017

- Guided students in coding, debugging, and designing circuits and assembly code for assigned labs, starting with building a full adder and ending with a fully operational CPU (LA, TA)
- Led and taught recitations twice a week (TA)
- Graded, proctored, and designed exams (TA)
- Attended weekly staff meetings (TA)

6.117: Intro Electrical Engineering Lab; 6.149: Intro to Python

Cambridge, MA

Lab Assistant (LA)

Jan 2016, 2017

- Guided students with no circuit/EE experience in reading schematics and building circuits (6.117)
- Teach students how to use oscilloscopes, logic analyzers, multimeters, function generators, and other tools (6.117)
- Guided students with no coding experience in writing and debugging Python software (6.149)

Professional Experience

- **Amazon**

Seattle, WA

Prime Music Stations SDE Intern

Summer 2016

  - Designed/coded data structures to improve handling of track history for playback
  - Designed/coded algorithm to prevent overplaying of popular tracks without removing relative popularity of different tracks
  - Developed in large codebase dominated by Java and Spring
  - Received full-time offer at end of summer

- **Mellanox Technologies**

Yoqneam, Israel

High Speed Algorithms Team Intern

Summer 2015

  - Designed error correction and cancellation filters for high speed communication links
  - Modelled ideal filters in Matlab using search algorithms and sampled data
  - Tested designs on main switchboard API (based in C++)

Publications/Projects

Christine Konicki, Mithun Chakraborty, and Michael P. Wellman. **"Exploiting Extensive-Form Structure in Empirical Game-Theoretic Analysis."** WINE 2022: 132-149.

Christine Konicki and Virginia Vassilevska Williams. **"Bribery in Knockout Tournaments."** AAMAS 2019: 2066-2068

Code for Good: Mina's List Project (January 2016)

- Designed and implemented the basic functionality of a fundraising web/mobile banking app for Mina's List
- The app would allow female politicians all over the world to engage with their support base and receive donations

Awards/Skills

Rackham Conference Travel Grant for WINE 2022

Michigan Mathematics Prize Competition Finalist 2010-2012

Software: Proficient in Java, Python, Verilog, x86 Assembly, Arduino, Matlab, Mathematica, Spring, LaTeX, Bash, Git; Basic skill in Javascript, HTML/CSS, MongoDB

Foreign Languages: Proficient in Spanish, basic Hebrew