Cooper Sigrist

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*A good teacher knows what they teach, a great teacher knows why they teach it, but the teachers that change lives, they know **who** they are teaching.*

Education

MS/PhD in Computer Science — ***Current 5th Year***
UMass Amherst, SOLAR lab — *2020–Current*

B.S. in Computer Science and Mathematics — ***3.87 GPA***
UMass Amherst — *2016–2020*

Awards

Distinguished Teaching Award — *2024, 2025*
Nominated, Finalist, 2025 recipient TBA

Delores M. Etter Top Scientists and Engineers Award — *2024*
Department of the Navy (DON) sponsored scholarship

Dissertation Writing Fellowship Award — *2024*
UMass Amherst Computer Science Department

University of Toronto Machine Learning Research Competition — *2022, 2024*
First place, Third place

Teaching Appointments

Teaching Associate / Graduate Teaching Fellow — **UMass Amherst**
Sole lecturer, material designer, with team of PhD Teaching Assistants each semester. — *2021–current*

- **Introduction to Machine Learning (CS389)**, 80 students, Third/Fourth-year level:
  - Co-designed the original curriculum alongside Phillip Thomas in Spring 2021.
  - Sole Designer and Lecturer Spring 2022, 2023, and 2024.
  - All STRI survey scores were equal/above both department and campus averages in every criteria.
  - Resulted in Distinguished Teaching Award nomination in Spring 2023 and 2024
- **Foundations of Programming (CS110)**, 60 students, First/Second-year level:
  - Taught both CS and non-CS students with a high variance of previous exposure, Fall 2024.
  - Proposed and created an experimental section based on my previously taught classes.
  - Newly designed structure and final project currently implemented in CS intro sequence.
- **Thinking with Machine Learning (First-year Seminar)**, 25 students
  - Designed seminar alone in Fall 2021. Still currently being offered at UMass Amherst.

Teaching Assistant — **UMass Amherst**
Material creation, office hours, running discussion section. — *2020–2023*

- **Algorithms** (**CS311**), Fall 2020, 2021, 2022
  - Assisted distinguished professors: Ramesh Sitaraman, David Barrington, Hava Siegelmann, and Dan Sheldon
- **Artificial Intelligence** (**CS383**), Fall 2020
- **Introduction to Machine Learning** (**CS389**), Spring 2021
  - Head Teaching Assistant and co-designer of course in preparation for teaching future semesters.

Advising and Mentoring

Programs

UMass Amherst Machine Learning and Machine Learning Research Clubs *2017-Current*

Founder and President (2017-2022)

- Two weekly meetings covering beginner lectures, workshops, and semester-long group project.
- Acting Graduate liaison and advisor.

University of Toronto Yearly Machine Learning Research Competition *2019–current*

Leader and organizer of the UMass Amherst team.

- First Place in 2022, resulting in a submitted paper and $20,000 prize.
- Third Place in 2024, resulting in a conference publication.

Research Experience for Undergrads (REU) and Undergrad Research Volunteer (URV) *2020–2024*

Graduate Advisor, Multiple Programs

- Most recently, advised in the CEET REU, work published at ACM E-Energy 25.

BINDSling Undergraduate Research Program at BINDSlab, UMass Amherst *2019-2021*

Creator and Advisor

Program for underrepresented undergraduate students to get involved in research.

- Approximately 20 students advised over the course of 4 semesters and 2 summers
- Active focus on underprivileged groups, resulting in several graduate careers.

Currently Advised Students

Ryan Boldi *2021–current*

- Goldwater Scholarship and Rising Researcher award
- Part of the winning 2022 UofT research competition team and 3rd place 2024 team
- Accepted PhD student at MIT

Aadam Lokhandwala *2021–current*

- Bay State Fellowship at UMass Amherst
- Part of the winning 2022 UofT research competition team
- Current M.S. student and Teaching Associate at Umass Amherst

Mimi Lertsaroj *2024–current*

- Honors Thesis Award and Bay State Fellowship at Umass Amherst
- Part of the third-place 2024 UofT research competition team
- Accepted M.S. student at UMass Amherst

Archimedes Li *2024–current*

- Part of the third-place 2024 UofT research competition team
- Current Third-year at UMass Amherst

Research Appointments

Sustainability, Optimization, Learning and Algorithms Research Lab (SOLAR) **UMass Amherst**

Research Assistant *2022–current*

Working on data science and algorithm research for sustainability and equity.

- Created the SunSight library for rooftop solar dataset creation, visualization and policy simulation, used for accepted papers and in-progress Nature submission.
- Developed a Multi-objective optimizing evolutionary neural network method for Rooftop Solar Panel Placement.
- Created, formalized and analyzed the "Green Bin Packing" problem for carbon-efficient job-allocation.
- Analyzed the 1-min problem under "better-than-random" advice and speed constraints.

Biologically Inspired Neuro-Dynamical Systems Lab (BINDS) **UMass Amherst**

Research Assistant *2018–2022*

Worked on Biologically-plausible machine learning and theoretical analysis thereof.

- Major contributor of the BINDSnet library for Spiking Neural Network simulation.
- Developed a minibatching procedure for SNN training that gave large speedup.
- Theoretically analyzed the computational power of a Spiking Neuron compared to Artificial Neurons.
- Developed a circuit simulation method using Graph Neural Networks with 100% accuracy.

Publications

[1] Daniel J. Saunders, **Cooper Sigrist**, Kenneth Chaney, Robert Kozma, and Hava T. Siegelmann. "Minibatch Processing for Speed-up and Scalability of Spiking Neural Network Simulation". In: *2020 International Joint Conference on Neural Networks (IJCNN)*. 2020, pp. 1–8. DOI: 10.1109/IJCNN48605.2020.9207452.

[2] Magnus Berg*, Shahin Kamali*, Katherine Ling*, and **Cooper Sigrist***. "Space-Efficient Data Structures for Polyominoes and Bar Graphs". In: *2024 Data Compression Conference (DCC)*. 2024, pp. 253–262. DOI: 10.1109/DCC58796.2024.00033.

[3] **Cooper Sigrist**, Adam Lechowicz, Jovan Champs, Noman Bashir, and Mohammad Hasjiesmaili. "Lost in Siting: The Hidden Carbon Cost of Inequitable Residential Solar Installations". In: E-Energy 2025.

Submitted/Ongoing work

[4] **Cooper Sigrist**, Archimedes Li, Mimi Lertsaroj, Ryan Boldi, Adam Lechowicz, Noman Bashir, and Mohammad Hasjiesmaili. "Learning to Site: A Multi-objective Optimization of Rooftop Solar Installations using Evolutionary Neural Networks". Submitted E-Energy 2025.

[5] **Cooper Sigrist**, Jackson Bibbens, Shahin Kamali, Bo Sun, Mimi Lertsaroj, and Mohammad Hasjiesmaili. "Green Bin Packing". Submitting Sigmetrics 2025.

[6] **Cooper Sigrist**, Archimedes Li, Mimi Lertsaroj, Ryan Boldi, Adam Lechowicz, Noman Bashir, and Mohammad Hasjiesmaili. "A More Sustainable, Energy-Efficient, and Equitable strategy for Rooftop Solar Photovoltaics". Submitting Nature Energy.

Advised work

[7] Mimi Lertsaroj, **Cooper Sigrist**, Arjun Karuvally, and Hananel Hazan. *Spontaneous Convergence of Spiking Neural Networks in Classification*. Submitting Neurips Workshop 2025.

[8] Ryan Boldi*, Aadam Lokhandwala*, Edward Annatone, Yuval Schecter, Alexander Lavrenenko, and **Cooper Sigrist**. *Improving Recommendation System Serendipity Through Lexicase Selection*. URL: https://arxiv.org/abs/2305.11044.

References

- **Ramesh Sitaraman:** Distinguished Professor at UMass Amherst, my co-advisor, ramesh@cs.umass.edu.
- **Mohammad Hasjiesmaili:** Associate Professor at UMass Amherst, my co-advisor, hajiesmaili@cs.umass.edu.
- **Phil Thomas:** Associate Professor at UMass Amherst, teaching colleague, pthomas@cs.umass.edu.
- Student references available upon request.