Adam Lechowicz

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Education

University of Massachusetts Amherst (Manning CICS), *Ph.D. Computer Science* 2022 –
Supported by DOE Computational Science Graduate Fellowship, 2023 –
Advised by: Mohammad Hajiesmaili and Prashant Shenoy

University of Massachusetts Amherst 2019 – 2022
B.S. Computer Science & B.A. Political Science, summa cum laude
Phi Beta Kappa, 21st Century Leader. GPA: 3.99 / 4.0
Honors Thesis (Advisor: Cameron Musco): Edge Dynamics and Opinion Polarization in Social Networks

Research Interests

I work at the intersection of theory and systems, with an emphasis on problems that hold implications for energy, equity, and climate change. From a theoretical perspective, I am interested in algorithms for online optimization, particularly of the learning-augmented or provably fair varieties. On the application side, I am especially interested in novel system designs that accelerate the decarbonization of societal energy systems and computing infrastructure.

Experience

Ph.D. Intern **Golden, Colo.**
Power Systems Engineering Center, National Renewable Energy Laboratory (NREL) Summer 2024
- Advised by Dr. Joshua Comden – *areas: Incentive design, Power system control*

Visiting Researcher **Pasadena, Calif.**
Computing and Mathematical Sciences, California Institute of Technology Summer 2023
- Advised by Prof. Adam Wierman – *areas: Online optimization, Carbon-aware computing*

Research Assistant **Amherst, Mass.**
Manning College of Information and Computer Sciences Jun. 2022 – May 2023
- Designed algorithms for online problems such as knapsack and online search, and worked on residential heating decarbonization in a small city
- *areas: Online optimization, Algorithmic fairness, Energy analytics*

Course Assistant **Amherst, Mass.**
Intro to Machine Learning (CS 389) – College of Information and Computer Sciences Spring 2022

Publications and Academic Papers

† – *indicates undergraduate I advised* $(\alpha-\beta)$ – *indicates alphabetical author order*

Julia Köhlke, Adam Lechowicz, Oluwole Fabikun†, Noman Bashir, Abel Souza, Prashant Shenoy, and Sebastian Lehnhoff
Examining the adoption of electromobility concepts across social contexts for energy transition
ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys), 2024.

Adam Lechowicz and Joshua Comden
Distribution Grid Incentive Design with Unknown Agent Behavior
Seventh Workshop on Autonomous Energy Systems, 2024.

Adam Lechowicz, Nicolas Christianson, Bo Sun, Noman Bashir, Mohammad Hajiesmaili, Adam Wierman, and Prashant Shenoy
Chasing Convex Functions with Long-term Constraints
International Conference on Machine Learning (ICML), 2024.

Roozbeh Bostandoost, Walid A. Hanafy, Adam Lechowicz, Noman Bashir, Prashant Shenoy, and Mohammad Hajiesmaili
Data-driven Algorithm Selection for Carbon-Aware Scheduling
HotCarbon Workshop on Sustainable Computer Systems, 2024.

Adam Lechowicz, Nicolas Christianson, Bo Sun, Noman Bashir, Mohammad Hajiesmaili, Adam Wierman, and Prashant Shenoy
Online Conversion with Switching Costs: *Robust and Learning-augmented Algorithms*
ACM SIGMETRICS / IFIP Performance, 2024.

Roozbeh Bostandoost, Adam Lechowicz, Walid A. Hanafy, Noman Bashir, Prashant Shenoy, and Mohammad Hajiesmaili
LACS: Learning-Augmented Carbon-Aware Resource Scaling for Uncertain Demand
ACM International Conference on Future Energy Systems (e-Energy), 2024.

Adam Lechowicz, Rik Sengupta, Bo Sun, Shahin Kamali, and Mohammad Hajiesmaili
Time Fairness in Online Knapsack Problems
International Conference on Learning Representations (ICLR), 2024.

Adam Lechowicz, Nicolas Christianson, Bo Sun, Noman Bashir, Mohammad Hajiesmaili, Adam Wierman, and Prashant Shenoy
Learning-Augmented Competitive Algorithms for Spatiotemporal Online Allocation with Deadline Constraints
In submission, 2024.

Mohammadreza Daneshvaramoli, Helia Karisani, Adam Lechowicz, Bo Sun, Cameron Musco, and Mohammad Hajiesmaili
Near-Optimal Consistency-Robustness Trade-Offs for Learning-Augmented Online Knapsack Problems
In submission, 2024.

Cooper Sigrist, Adam Lechowicz, Jovan Champ, Noman Bashir, and Mohammad Hajiesmaili
Lost in Siting: The Hidden Carbon Cost of Inequitable Residential Solar Installations
In submission, 2024.

Adam Lechowicz, Joshua Comden, and Andrey Bernstein
Optimizing Individualized Incentives from Grid Measurements and Limited Knowledge of Agent Behavior
In submission, 2024.

Anupama Sitaraman, Adam Lechowicz, Noman Bashir, Xutong Liu, Prashant Shenoy, and Mohammad Hajiesmaili
Dynamic Incentive Allocation for City-scale Deep Decarbonization
In submission, 2024.

Adam Lechowicz, Nicolas Christianson, Jinhang Zuo, Noman Bashir, Mohammad Hajiesmaili, Adam Wierman, and Prashant Shenoy
The Online Pause and Resume Problem: *Optimal Algorithms and An Application to Carbon-Aware Load Shifting*
Proc. of the ACM on Measurement and Analysis of Computing Systems, Dec. 2023. Also in SIGMETRICS / Performance '24.

Adam Lechowicz, Noman Bashir, John Wamburu, Mohammad Hajiesmaili, and Prashant Shenoy
Equitable Network-Aware Decarbonization of Residential Heating at City Scale
ACM International Conference on Future Energy Systems (e-Energy), 2023.

Nikita Bhalla, Adam Lechowicz, and Cameron Musco $(\alpha{-}\beta)$
Local Edge Dynamics and Opinion Polarization
ACM International Conference on Web Search and Data Mining (WSDM), 2023.

Bhawana Chhaglani, Camellia Zakaria, Adam Lechowicz, Jeremy Gummeson, and Prashant Shenoy
FlowSense: Monitoring Airflow in Building Ventilation Systems Using Audio Sensing
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), March 2022.

Honors and Awards

National Science Foundation: Student Travel Grant (for ACM SIGMETRICS 2024) — Spring 2024
U. of Michigan, Georgia Tech, UC San Diego: 2023 NextProf Pathfinder Workshop (invited) — Fall 2023
Manning CICS: Dr. C. Mohan Graduate Scholarship — Fall 2023
U.S. Department of Energy: Computational Science Graduate Fellowship — 2023-2027
ACM SIGIR: Student Travel Grant (for ACM WSDM 2023) — Spring 2023
National Science Foundation: Student Travel Award (for ACM WSDM 2023) — Spring 2023
Energy Transition Institute: NSF ELEVATE Fellowship — 2022-2024
UMass Amherst: Class of 2022 – 21st Century Leader Award (highest undergraduate honor) — Spring 2022
Manning CICS: Outstanding Undergraduate Achievement Award — Spring 2022
UMass Amherst: 2021-2022 UMass Amherst Rising Researcher — Spring 2022
Manning CICS: Senior Leadership Award — Spring 2022
Manning CICS: Outstanding Undergraduate Course Assistant Award — Spring 2022
UMass Amherst: Inducted into Phi Beta Kappa & Phi Kappa Phi Honor Societies — Spring 2021
UMass Amherst: David C. Knapp Scholarship — Spring 2020
Massachusetts Department of Higher Education: John and Abigail Adams Scholarship — Fall 2018

Presentations

$\star$ – *indicates invited*

Online Optimization with Switching Costs and Long-term Constraints — Aug. 2024
$\star$ *SODALab Group Meeting @ University of Alberta* (Slides)

Equitable Network-Aware Decarbonization of Residential Heating at City Scale Apr – May. 2024
⋆ *PIT × UMass: Developing Tech for the Public Interest* (***poster in library exhibit***)

Theoretical Foundations for Carbon-aware Load Shifting Feb. 2024
ELEVATE Retreat, Energy Transition Institute @ UMass

Fresh Challenges for Online Problems: new directions motivated by practice Jun. 2023
⋆ *RSRG / FALCON Lunch Seminar @ Caltech* (Slides)

On the Necessary "Unfairness" of Competitive Online Algorithms Nov. 2022
UMass CS Theory Seminar (Slides)

Edge Dynamics and Opinion Polarization in Social Networks Apr. 2022
Honors Thesis Defense (Slides)

Machine Learning for Absolute Beginners – Mathematical Foundations of ML Nov. 2021
Workshop @ HackUMass IX (Slides)

Research Advising and Mentorship

Tri Than *(UG, UMass)* – Undergraduate Research 2024 –
Rohan Shenoy *(UG, UC Berkeley)* – Undergraduate Research 2024 –
Anisha Prathi *(UG, UMass)* – Undergraduate Honors Thesis 2023 –
Kaosisochukwu Nwosu *(UG, UMass)* – Undergraduate Research Assistant 2023 –
Lily Davoren *(UG, Bryn Mawr)* – Computing for an Equitable Energy Transition REU Summer 2023
Coo Katsuno, Saif Masoud, Riley Kim Connell *(UG, UMass)* – URV Program @ MCICS Summer 2023
Oluwole Fabikun *(UG, UMass)* – LSAMP Scholar – (*featured in graduating "Senior Series"*) 2023 – 2024

Other Professional Experience

Student Trustee – *Board of Trustees, University of Massachusetts* **Boston, Mass.**
- Served as student representative of the Amherst campus on system-wide Board of Trustees. Jul. 2022 – Jul. 2023

Peer Advisor – *Manning College of Information and Computer Sciences* **Amherst, Mass.**
- Advised students on course selection and offered guidance for struggling students. Jan. 2021 – Jan. 2022

Web Developer – *Public Higher Education Network of Massachusetts (PHENOM)* **Worcester, Mass.**
- Created new web UI & recruitment tools for a nonprofit in the higher education sector. Dec. 2020 – Nov. 2021

Summer Engineering Intern – *Bin1 ATE* **Ashland, Mass.**
- Intern at firm building automated test equipment for semiconductor manufacturing May. 2019 – Aug. 2019

Side Projects

Venti – *macOS application, JavaScript & shell* Winter 2023
A carbon-aware battery management tool for Apple silicon MacBooks. Used to prolong battery health and defer charging to periods of time when grid electricity is sufficiently clean.

Backtrack – *iOS application, Swift & SwiftUI* Summer 2021
A privacy-centric, open-source location logging solution that provides a history of location data for a personal device with minimal battery impact, leveraging deep API integration.

Béton3 Macro Pad – *Hardware and firmware design, C, CAD, Arduino* Summer 2020
Created an Arduino-based open-source input device design hosted on GitHub. Custom firmware, hardware, CAD chassis, and concrete cast volume knob.

Service

– Program Committees –

Workshop on Learning-augmented Algorithms: Theory and Applications, *SIGMETRICS '23* Jun. 2023

– Conference and Workshop Reviewing –

International Conference on Learning Representations (ICLR) 2025
ACM SIGMETRICS (*subreviewer*) 2024, 2025

– Seminars –

Grad Student Organizer – CS Systems & Sustainability Lunches, UMass Amherst Fall 2024 – ongoing

Grad Student Organizer – CS Theory Seminar, UMass Amherst — Spring 2024 – ongoing

Grad Student Organizer – Algorithms with Predictions Seminar, UMass Amherst — Fall 2022

– *Department & University Service* –

New Building Committee – Manning CICS — Jun. 2022 – ongoing

Headmaster (Organizer) – OlympCICS – Manning CICS — Jan. 2024
- Organized the 2nd iteration of an annual competition and celebration for CS PhD students.

Grad Student Social Committee – Manning CICS — Sep. 2023 – Aug. 2024

New PhD Student Committee – Manning CICS — Sep. 2023 – Aug. 2024

Committee Against Racism and for Equity – Structural Barriers to Academic Success — Sep. 2021 – Aug. 2022

Flexible Learning Task Force & Implementation Committee – UMass Amherst — Jan. 2021 – May 2022

– *Outreach & Volunteering* –

Workshop Co-lead and Presenter – Holyoke Energy Justice Leaders Workshop #3 — May 2024

Judge – HackUMass XI (hackathon) — Nov. 2023

Mentor – Undergraduate Research Volunteers (URV) Program — Summer 2023

Mentor & Instructor – UMass Turing Summer Program — Summer 2022 & 2023

Founder & Editor-in-Chief – UMass Index Yearbook — Aug. 2020 – Jul. 2022
- Led a successful effort to revive the university's yearbook – took project from conceptual stage to raising funds from scratch through preorders and delivering several hundred books.

Organizing Co-director – UMass CEPA Food Justice Campaign — Sep. 2019 – May 2021
- Leadership role in a campaign focused on advocacy around food insecurity and sustainability

Senator, Secretary of Technology – UMass Student Government Association — Sep. 2019 – May 2022

Skills

Python; C/C++; Swift; Java; Kotlin; JavaScript; MATLAB; SQL; HTML/CSS
NumPy; SciPy; NetworkX; pandas; scikit-learn; PyTorch; CVX; Xcode; Arduino; SolidWorks