Lauren Conger

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Computing and Mathematical Sciences
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Education

California Institute of Technology
PhD, Control and Dynamical Systems (Sept 2020-present).
Advisors: Eric Mazumdar, Franca Hoffmann, John C. Doyle

Cornell University
BS, Electrical and Computer Engineering (Aug 2015- Dec 2018).
Summa Cum Laude, physics minor

Publications

Conger, Li, Wierman, Mazumdar. *Characterizing Controllability and Observability for Systems with Locality, Communication, and Actuation Constraints.* Under review 2024

Yu, Shi, Yeh, Wierman, Ho, **Conger**, Li. *Set-Based Online Adaptation for Robust Learning and Control of Sustainable Energy Systems.* Under review 2023.

Conger, Hoffmann, Mazumdar, and Ratliff. *Coupled Gradient Flows for Strategic Distribution Shift.* NeurIPS 2023.

Y Li, J Yu, **Conger**, T Kargin, Wierman. *Learning the Uncertainty Set for Control Dynamics via Set Membership: A Non-Asymptotic Analysis.* ICML 2024.

Conger, Mazumdar, and Doyle. *Linear-Quadratic Games via System Level Synthesis.* Under review 2023.

Conger, Vernon, Mazumdar. *Designing System Level Synthesis Controllers for Nonlinear Systems with Stability Guarantees.* L4DC 2023.

Conger, Li J, Mazumdar, and Brunton. *Nonlinear System Level Synthesis for Polynomial Dynamics.* CDC 2022.

Conger and Tseng, *Output-Feedback System Level Synthesis via Dynamic Programming.* ACC 2022.

Gnadt, Belarge, Canciani, **Conger**,, Curro, Edelman, Morales, O'Keeffe, Taylor, Rackauckas. *Signal Enhancement for Magnetic Navigation Challenge Problem.* arXiv 2020.

Atakisi, **Conger**, Moreau and Thorne. *Resolution and dose dependence of radiation damage in biomolecular systems.* IUCr Journal 2019.

Talks & Visits

Semiautonomous Seminar at Berkeley December 2023
Strategic Distribution Shift of Interacting Agents via Coupled Gradient Flows

SIAM Student Seminar at Caltech October 2023
Inequalities for proving convergence of coupled PDEs for modeling distribution shift

Group Seminar, Harvard University May 2023
Coupled Gradient Flows for Strategic Non-Local Distribution Shift

Research Seminar, MIT Lincoln Lab Homeland Protection Systems May 2023
Coupled Gradient Flows for Strategic Non-Local Distribution Shift

Group Seminar, University of Washington August 2022
System Level Synthesis: Parameterization for Linear and Nonlinear Control

Conferences & Workshops

June 2022 American Control Conference, *presentation*, Atlanta USA
Dec 2022 Conference for Decision and Control, *presentation*, Cancun MX
June 2023 Learning for Decision and Control, *poster*, Philadelphia USA
July 2023 Intl Conference for Machine Learning, *workshop poster*, Honolulu USA
Dec 2023 Neural Information Processing Systems, *main track poster,* New Orleans USA
April 2024 Aggregation-Diffusion Equations & Collective Behavior, *poster*, Marseille FR
April 2024 Southern California Control Workshop, *presenter*, UCLA USA
May 2024 Interacting Particle Systems: Analysis, Control, Learning & Computation, *poster*, Brown Univ. USA

Upcoming

June 2024 Research School: Frontiers in Interacting Particle Systems, Aggregation -Diffusion Equations & Collective Behavior, Marseille FR
July 2024 Modern Perspectives in Applied Mathematics: Theory and Numerics of PDEs, Zürich CH
July 2024 European Congress of Mathematics, Seville ES

Awards & Fellowships

PIMCO Graduate Fellow in Data Science
January 2024 tuition and living stipend support

National Defense Science and Engineering Graduate Fellowship
Sept 2022 - July 2025 tuition, living stipend, travel funds, health insurance

National Science Foundation Graduate Research Fellowship Awardee
April 2022 three years tuition, living stipend

Linde Institute of Economic Sciences Research Grant, Caltech
Oct 2021 $5k

Employment

MIT Lincoln Laboratory
Assistant Technical Staff, February 2019 - August 2020
Radar simulation, C++ implementation of camera tracker with learning algorithm, optimization of high-dimensional parameter spaces,
frequency analysis algorithms for synthetic UAV motion, denoising magnetic fields

Raytheon Missile Systems
Signal Processing Intern, Summer 2016-2018
radar analysis, tracking algorithms, SAR imaging, fire control testing on Phalanx

Teaching & Mentoring

Caltech, Computing and Mathematical Sciences Teaching Assistant
Computer Science Education in K-14 Settings, Winter 2024
Linear Control Systems, Fall 2023
Networks and Economics, Winter 2021

Cornell University, Electrical Engineering Teaching Assistant
Mathematics of Signals and Systems, Spring 2018
Signal Processing, Fall 2018

Cornell University, Physics Teaching Assistant
Mechanics and Heat, Fall 2016
Waves and Quantum Mechanics, Spring 2017 and Fall 2017

Mentorship
(1) Sydney V: Caltech undergrad research mentor for machine learning application of nonlinear control; paper published (Summer 2022)
(2) Sultan D and Ting L: Caltech Accountability Partnership Program – advising on graduate school applications (Fall 2022, Fall 2023)
(3) Sarvagna V: Caltech summer first year research initiative mentor. (Summer 2023)
(4) Jennifer Y: First year graduate student mentor for Women in CMS (AY 2022-23)
(5) iSTEM scholars research mentor – organized team of 4 Caltech grad students to mentor 2 high school students (Summer 2021)
(6) Cornell University Chorus Mentor – current engineering student (Fall 2023-pres.)

Service

Outreach
Caltech CS activities tabling at local elementary schools (quarterly 2023)
curriculum developer and instructor for free/low-cost middle school CS course (2020)
volunteer STEM career speaker for middle school (2020)
Southern Arizona Regional Science Fair judge (spring, 2020-2024)

Academic
Caltech Computing and Mathematical Sciences advisory board (Aug 2021 – pres.)
Women in CMS organizer (Spring 2023-pres.)
ACC reviewer (2022, 2023)

CDC reviewer (2022, 2023, 2024)
L4DC reviewer (2023)
TAC reviewer (2023)
ICML workshop reviewer (2023)
Graduate admissions committee for CMS department (2024)

References

Franca Hoffmann, Assistant Professor
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California Institute of Technology
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Eric Mazumdar, Assistant Professor
Computing and Mathematical Sciences
California Institute of Technology
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