# Lauren Conger

California Institute of Technology
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

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