Dan Li

Curriculum vitae

March 2022

Michigan Institute for Data Science
University of Michigan, Ann Arbor
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Positions

Michigan Data Science Fellow, Michigan Institute for Data Science (MIDAS)
University of Michigan, Ann Arbor, MI, US (Sep 2021-present)

Research Fellow, Electrical Engineering and Computer Science
University of Michigan, Ann Arbor, MI, US (Sep 2021-present)

Research Assistant, Mechanical and Aerospace Engineering
University of California, San Diego, CA, US (Aug 2016-Sep 2021)

Research Assistant, Chemical Engineering
Queen's University, Kingston, ON, Canada (Dec 2013-Jul 2016)

Process System Specialist
State Grid Corporation of China, Hangzhou, Zhejiang, China (Jun 2012-Nov 2013)

Visiting Student
University of York, UK (Jan 2013-Feb 2013)

Research Assistant, Process Systems Engineering Lab, Information College
Zhejiang University, Hangzhou, Zhejiang, China (May 2012-Nov 2013)

Education

University of California, San Diego, San Diego, CA, US
Ph.D., Dynamical system and controls, GPA: 4/4 Sep 2021
Thesis: *Data-driven online optimization and control with performance guarantees*
Adviser: Prof. Sonia Martinez

Queen's University, Kingston, ON, Canada
M.Sc., Optimization in Chemical Engineering, GPA: 4.3/4.3 Jul 2016
Thesis: *Benders Decomposition-based Global Optimization for Natural Gas and Power Flow Systems*
Adviser: Prof. Xiang Li

Zhejiang University, Hangzhou, Zhejiang, China
B.S., *Honors degree*, Control Science and Engineering, GPA: 3.83/4, Chu Kochen College Jul 2013
Dissertation: *Modeling and Validation of Remaining Mileage for Electric Vehicles*
Adviser: Prof. Zhijiang Shao

Research Interests

Data-driven Optimization; Systems and Control; Large-scale Optimization Algorithms; Robotics; Cyber-Physical Systems; Power Systems; Transportation Systems; Attack Detection; Networked Systems; Distributed Algorithms; Nonlinear Systems

Citation Metrics (March 2022)

Google Scholar: H-index 4, sum of citations 44

Honors and Awards

Michigan Data Science Fellows (DS Fellows) Program, 2021
Michigan Institute for Data Science, University of Michigan, Ann Arbor, US
IEEE CSS Travel Award, 2018, 2020
IEEE Conference on Decision and Control
UCSD Fellowship Award, 2016
University of California, San Diego, US
Queen's Graduate Award, 2014-2015
Queen's University, Canada
Most Creative Poster Award, 2015
AQChem Poster Research Day, Queen's University, Canada
CSChE Travel Award, 2014
CSCHE, Queen's University, Canada
Nice Scholarship, 2012
Nice Education Co.Ltd, external scholarship, Zhejiang University, China
Mathematical & Interdisciplinary Contest In Modeling, 2012
Honorable Mention, US
'SUPCON' Robot Competition, 2012
Third class prize, Zhejiang University, China
Scholarship for Excellence in Research & Innovation, 2012
Zhejiang University, China
Scholarship for Outstanding Students, 2011-2012
Zhejiang University, China
Scholarship for Outstanding Merits, 2010-2012
Zhejiang University, China
Excellent Student Awards, 2011
Zhejiang University, China
Hope Cup National Mathematics Invitational Tournament, 2007
Silver Medal, China

Professional Service (19 reviews in total)

Reviewer for journals, IEEE Transactions on Control of Networked Systems, IEEE Transactions on Automatic Control, IEEE Control System Letters, Automatica, Computers and Operations Research, Electric Power Systems Research

Reviewer for conferences, IEEE Conference on Decision and Control, American Control Conference, International Conference on Cyber-Physical Systems

Members, Institute of Electrical and Electronics Engineers (IEEE), IEEE-control system society

University Services

Mentor, Jacobs Undergraduate Mentoring Program (2018-2019), UCSD

Member, Dow Sustainability Fellowship Committee (2021-2022), U Michigan

Research Grant Participation

- Office of Naval Research (ONR) Multidisciplinary University Research Initiatives (MURI), *Control and Learning Enabled Verifiable Robust AI (CLEVR-AI)*, PIs: Peter Bartlett at UC Berkeley, Necmiye Ozay at U Michigan, Noah J. Cowan and Rene Vidal at Johns Hopkins U, Octavia Camps, Milad Siami, Eduardo Sontag and Mario Sznaier(lead) at Northeastern U. $7.5M ($900k U Michigan amount), 2021-2026
- Joint TRI-University Projects, *Intelligent Testing with Interpretable and High-Capacity Agents by Embedding Logical Structure in Neural Architectures* Lead Company: Toyota Research Institute. TRI-PI: Nikos Arechiga, co-PIs: Andrew Best, Jonathan DeCastro, Jin Ge. University PI: Marco Pavone at Stanford, co-PIs: Necmiye Ozay at U Michigan, Sanjit A. Seshia at UC Berkeley. $1,423,984. 2021-2024
- Air Force Office of Scientific Research (AFOSR) grant *On resiliency of dynamic networks in adversarial environments* PI: Fabio Pasqualetti at UC Riverside, Co-PI: Sonia Martínez, and Jorge Cortés at UC San Diego. Corresponding individual amount is $500,000. July 2019 - 2022
- Office of Naval Research (ONR) SBIR/STTR Phase II contract *Data Architecture Enabling Robust Cooperative Autonomy with Minimal Information Exchange* Lead Company: Orbit Logic, Colorado. PI: Nisar Ahmed at CU, Sonia Martínez at UC San Diego. $298,275 (UCSD amount). March 2019 - September 2020
- Defense Advanced Research Projects Agency (DARPA) Lagrange grant *Distributed Robust Data-Driven Control and Optimization* PI: Sonia Martínez, Co-PIs: Jorge Cortés at UC San Diego and Daniel Tartakovsky at Stanford University. $ 661,326. 2018 - 2019
- National Sciences and Engineering Research Council of Canada (NSERC) RGPIN 418411-13 PI: Xiang Li at Queen's University. 2014-1016

Teaching Assistance

MAE145 *Intro to Robotic Planning and Estimation*, with Prof. Sonia Martinez at UC San Diego. 2021
CHEE209 *Analysis of Process Data*, with Prof. Thomas J. Harris at Queen's University. 2015
CHEE319 *Process dynamics and control*, with Prof. Martin Guay at Queen's University. 2014
CHEE222 *Process dynamics and numerical methods*, with Prof. Xiang Li at Queen's University. 2014

Patents

(P-2) D. Li and Z.J. Shao. Electric vehicle battery management method. CN103632204 A, Mar 12th 2014. patent, available here

(P-1) D. Li and Z.J. Shao. Method for performance evaluation of vehicle-mounted power batteries of electric automobiles. CN103488894 A, Jan 1st 2014. patent, available here

Journal Papers

(JP-7) D. Li, D. Fooladivanda, and S. Martínez. Online optimization and learning in uncertain dynamical environments with performance guarantees. In *Automatica*, 2021. Under review

(JP-6) D. Li, D. Fooladivanda, and S. Martínez. Online learning of parameterized uncertain dynamical environments with finite-sample guarantees. *IEEE Control Systems Letters*, 5(4):1351 – 1356, 2021

(JP-5) D. Li and S. Martínez. High-confidence attack detection via Wasserstein-metric computations. *IEEE Control Systems Letters*, 5(2):379–384, 2021

(JP-4) D. Li, D. Fooladivanda, and S. Martínez. Data-driven predictive control for a class of uncertain control-affine systems. *International Journal on Robust and Nonlinear Control*, 2021. Under review

(JP-3) D. Li and S. Martínez. Online optimization and data assimilation with performance guarantees. *IEEE Transactions on Automatic Control*, 66(5):2115–2129, 2021

(JP-2) D. Li and X. Li. A new optimization model and a customized solution method for natural gas production network design and operation. *AIChE Journal*, 63(3):933–948, 2017

(JP-1) D. Li and X. Li. Domain reduction for Benders decomposition based global optimization. *Computers & Chemical Engineering*, 93:248–265, 2016

Conference Proceedings

(CP-6) D. Li, D. Fooladivanda, and S. Martínez. Online learning of parameterized uncertain dynamical environments with finite-sample guarantees. In *American Control Conference*, New Orleans, LA, US, May 2021

(CP-5) D. Li and S. Martínez. High-confidence attack detection via Wasserstein-metric computations. In *IEEE Int. Conf. on Decision and Control*, Jeju Island, Korea, December 2020

(CP-4) D. Li, D. Fooladivanda, and S. Martínez. Data-driven variable speed limit design for highways via distributionally robust optimization. In *European Control Conference*, pages 1055–1061, Naples, Italy, 2019. ***Invited paper***

(CP-3) D. Li and S. Martínez. Online data assimilation in distributionally robust optimization. In *IEEE Int. Conf. on Decision and Control*, pages 1961–1966, Miami, FL, USA, December 2018

(CP-2) D. Li and X. Li. Decomposition-based global optimization for optimal design of power distribution systems. In *IEEE Int. Conf. on Decision and Control*, pages 3265–3270, Las Vegas, NV, USA, December 2016

(CP-1) D. Li and X. Li. Global optimization of an industrial natural gas production network. In *IFAC Symposium on Advanced Control of Chemical Processes*, volume 48, pages 337–342, Whistler, BC, Canada, June 2015

Conference Abstract, Workshop, Symposium and other Talks

(T-11) D. Li. Online learning and optimization in uncertain dynamical environments with performance guarantees. SIAM Conference on Control and Its Applications, July 2021. Virtual, Minisymposia

(T-10) D. Li. Data-driven optimization and control: performance guarantees under uncertainty. seminar, hosted by Necmiye Ozay's group, Apr 2021. University of Michigan, Ann Arbor, MI, US

(T-9) D. Li. Data-driven optimization and control: performance guarantees under uncertainty. talk, Mar 2021. Pengcheng Laboratory, Shenzhen, China

(T-8) D. Li. Data-driven optimization and control: performance guarantees under uncertainty. seminar, hosted by George J. Pappas and Nikolai Matni's group, Jan 2021. University of Pennsylvania, Philadelphia, PA, US

(T-7) D. Li and S. Martinez. Data-driven control with performance guarantees: variable speed limit design for highways. Southern California Control Workshop (SoCal), Jan 2020. San Diego, CA, US

(T-6) D. Li and X. Li. Efficient global optimization for a mixed ac-dc power distribution system. In *AIChE Annual Meeting*, November 2016. San Francisco, CA, US

(T-5) D. Li and X. Li. A customized global optimization method for mixed AC-DC power distribution systems. In *Canadian Chemical Engineering Conference (CSChE)*, October 2016. Québec City, Québec,Canada

(T-4) D. Li and X. Li. Enhancing NGBD with domain reduction techniques for stochastic nonconvex mixed-integer nonlinear programming. International Symposium on Mathematical Programming, July 2015. Pittsburgh, PA, US

(T-3) D. Li. Design and operation of natural gas production networks under uncertainty. Stats & Control Meeting, June 2015. Toronto, ON, Canada

(T-2) D. Li. Design and operation of natural gas production networks under uncertainty. Queen's Chem Annual Students Seminar, May 2015. Kingston, ON, Canada

(T-1) D. Li and X. Li. Optimization of natural gas production networks using nonconvex generalized benders decomposition and bound contraction. In *Canadian Chemical Engineering Conference (CSChE)*, October 2014. Niagara Falls, ON,Canada

Thesis

- D. Li. Benders decomposition-based global optimization for natural gas and power flow systems. Master's thesis, Queen's University, Canada, 2016. Available here

REFERENCES

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