Huayi Li

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Research Interests

Constrained and optimal control; Fault-tolerant control; Motion planning and control for connected and autonomous vehicles; Control-oriented modeling of traffic and vehicle systems; Safe, clean, and energy-efficient mobility.

Education

Ph.D. in Aerospace Engineering — **08/2018 – 04/2022**
University of Michigan, Ann Arbor — *Ann Arbor, MI, USA*

M.S. in Automotive Engineering — **08/2013 – 08/2015**
Clemson University — *Greenville, SC, USA*

B.S. in Automotive Engineering — **09/2009 – 07/2013**
China Agricultural University — *Beijing, China*

Appointment & Work Experience

Assistant Professor — **08/2023 – present**
Department of Mechanical and Aerospace Engineering, University of Kentucky — *Paducah, KY*

Postdoctoral Researcher — **07/2022 – 07/2023**
Texas A&M University — *College Station, TX*

Vehicle Modeling Engineer — **10/2016 – 08/2018**
Toyota Motor North America — *Ann Arbor, MI*

Model Based Design Engineer — **09/2015 – 10/2016**
Altair ProductDesign, onsite at Toyota Motor North America — *Ann Arbor, MI*

Vehicle System Analysis and Simulation Co-op — **01/2015 – 07/2015**
Volvo Group Trucks Technology — *Greensboro, NC*

Participated Projects (Selected)

U.S. DOT: Automated Vehicles for All — **07/2022 – 07/2023**
Postdoctoral Researcher, Texas A&M University
Supported by the U.S. Department of Transportation.

NSF ECCS-1931738: Mitigation Strategies for Enhancing Performance While Maintaining Viability in Cyber-Physical Systems — **05/2020 – 04/2022**
Graduate Student Research Assistant, University of Michigan, Ann Arbor
Supported by the National Science Foundation (NSF).

Mcity: Interactive Human–Autonomous Vehicle Dynamics in Traffic: Modeling, Simulation, and Control — **05/2019 – 05/2020**
Graduate Student Research Assistant, University of Michigan, Ann Arbor
Supported by Mcity at the University of Michigan.

Toyota: Process Development for Hybrid Electric Vehicle Powertrain Analysis — **10/2016 – 08/2018**
Engineer, Toyota Motor North America
Supported by Toyota Motor Corporation and partly collaborated with Argonne National Laboratory and Clemson University.

Publications

Book Chapter

B1 **H. Li**, N. Li, I. Kolmanovsky, and A. Girard, “Energy-efficient autonomous driving using cognitive driver behavioral models and reinforcement learning,” in *AI-enabled Technologies for Autonomous and Connected Vehicles*, pp. 283–305, Springer, 2023.

Journal

J1 **H. Li**, I. Kolmanovsky, and A. Girard, “Set-theoretic failure mode reconfiguration for stuck actuators,” *IEEE Control Systems Letters*, vol. 6, pp. 1316–1321, 2021.

J2 B. Xu, X. Hu, X. Tang, X. Lin, **H. Li**, D. Rathod, and Z. Filipi, “Ensemble reinforcement learning-based supervisory control of hybrid electric vehicle for fuel economy improvement,” *IEEE Transactions on Transportation Electrification*, vol. 6, no. 2, pp. 717–727, 2020.

Conference

C1 **H. Li**, I. Kolmanovsky, and A. Girard, “Integrating failure detection and isolation into a reference governor-based reconfiguration strategy for stuck actuators,” in *2022 American Control Conference (ACC)*, pp. 4311–4316, IEEE, 2022.

C2 **H. Li**, I. Kolmanovsky, and A. Girard, “A failure mode reconfiguration strategy based on constraint admissible and recoverable sets,” in *2021 American Control Conference (ACC)*, pp. 4771–4776, IEEE, 2021.

C3 **H. Li**, N. Li, I. Kolmanovsky, and A. Girard, “Energy-efficient autonomous vehicle control using reinforcement learning and interactive traffic simulations,” in *2020 American Control Conference (ACC)*, pp. 3029–3034, IEEE, 2020.

C4 **H. Li**, D. Liao-McPherson, I. Kolmanovsky, S. Kim, and K. Butts, “Analysis of multistage hybrid powertrains using multistage mixed-integer trajectory optimization,” tech. rep., SAE Technical Paper, 2020.

C5 **H. Li**, K. Butts, K. Zaseck, D. Liao-McPherson, and I. Kolmanovsky, “Emissions modeling of a light-duty diesel engine for model-based control design using multi-layer perceptron neural networks,” tech. rep., SAE Technical Paper, 2017.

Presentation & Poster

CPS Rising Stars Poster **05/26/2022**

CPS Rising Stars 2022 by the NSF at the University of Virginia
https://cps-rising-stars2022.com/participants/huayi-li/
Title: A Set-Theoretic and Reference Governor-Centric Control Strategy for Stuck Actuators

NSF CPS PI Meeting Graduate Student Presentation **06/02/2021**

NSF Cyber-Physical Systems Principal Investigators' Meeting 2021
Title: Set-Theoretic Failure Mode Reconfiguration Strategies Based on Constraint Admissible and Recoverable Sets

Service

Journal Reviewer

IEEE Transactions on Control Systems Technology
IEEE Transactions on Transportation Electrification
IEEE Transactions on Vehicular Technology
Elsevier Annual Reviews in Control

Conference Reviewer

American Control Conference (ACC) 2020, 2022
Society of Automotive Engineers World Congress Experience (SAE WCX) 2017, 2018, 2020, 2021

Conference Session Chair

American Control Conference (ACC) 2022, 2023