

Xiao Li

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Education

University of Michigan–Ann Arbor

Michigan, USA

M.S. in Mechanical Engineering, Controls, GPA: 4.0/4.0

Sept. 2019 - May 2021

- Honors: Jackson and Muriel Lum Fellowship

Shanghai Jiao Tong University

Shanghai, China

B.S. in Mechanical Engineering, GPA: 3.53/4.00, Ranking: 8/55

Sept. 2015 - Aug. 2019

- Honors: Excellent Freshman Scholarship, Yu Liming Scholarship, SJTU Outstanding Graduates

RWTH-Aachen

Aachen, Germany

Exchange Student in Mechanical Engineering

Oct. 2017 - Mar. 2018

Research

Safe Control of Learned Neural Network Dynamic System with Uncertainties

Pennsylvania, USA

Xiao Li, Tianhao Wei, Prof. Changliu Liu

May 2021 - Now

- Emulate the ground-true dynamics using a fully-connected neural network (NN)
- Formulate an optimal tracking problem with system uncertainties using mixed integer linear programming

A Set Theoretic Approach to RC Car Localization

Michigan, USA

Xiao Li, Yutong Li, Prof. Ilya Kolmanovsky

Jan. 2021 - Now

- Develop set membership based localization for CCTV system and infrastructure Lidar array
- Implement a convex polytope-based set estimation algorithm for localization and mapping using CORA in MATLAB
- Submit to ICRA 2022, preprint at [arxiv.org/abs/2110.01749]

Dynamic Scene Graph and Visual Navigation

Michigan, USA

Xiao Li, Yidong Du, Zhen Zeng, Prof. Chad Jenkins (aim for RA-L)

May 2020 - Now

- Design a cognitive map representation to enable a dynamic memory of scene set-ups for domestic robots
- Implement visual navigation and localization modules using SeanNet in AI2THOR with Python

SeanNet: Semantic Understanding Network for Localization Under Object Dynamics

Michigan, USA

Xiao Li, Yidong Du, Zhen Zeng, Prof. Chad Jenkins

May 2020 - Jun 2021

- Design a scene graph enhanced deep neuron network for localization under visual uncertainties using Pytorch
- Implement a visual navigation module with SeanNet for similarity based localization in AI2THOR with Python
- Submit to RA-L, preprint at [arxiv.org/abs/2110.02276]

Projects

Test Platform for Autonomous Driving Functionalities

Michigan, USA

Advisor: Prof. Ilya Kolmanovsky, Prof. Bogdan Epureanu

Sept. 2020 - Dec. 2020

- Tune OptiTrack camera localization and write a communication network for multi-agent system using python
- Implement path planning algorithm and Stanley steering controller for autonomous vehicle parking

FastSLAM and Data Association Error Analysis

Michigan, USA

Mobile Robotics (NAVARCH 568), Team Leader

Mar. 2020 - April. 2020

- Code FastSLAM with known and unknown data association in MATLAB
- Test the algorithm on self-generated map and implement FastSLAM on Victoria Park Dataset

Optimal Switching Control Law in Hybrid System

Michigan, USA

Flight Trajectory Optimization (AEROSP 575), Team Member

Mar. 2020 - April. 2020

- Use Pontryagin Maximum Principle to derive optimal switching law for linear time invariant switched systems
- Reproduce experiment from a paper on autonomous system using shooting method in MATLAB

Data-driven Analysis on SEIRS ODE

Michigan, USA

Machine Learning for Science (AEROSP 729), Team Leader

Mar. 2020 - April. 2020

- Parametrize SEIRS infectious disease model and investigate parameters' influence on epidemic trends
- Using neural network, dynamic modes decomposition and Koopman decomposition to predict system trajectory

Car with Transformable Wheel Using Compliant Origami Mechanism

Shanghai, China

Design and Manufacturing II Course, Group Leader

May 2018 - Aug. 2018

- Designed and fabricated the transformable origami wheels using laminated material
- Used AutoCAD and UG to build 3D models for car components and emulate transformation animation

Work Experiences & Activities

University of Michigan–Ann Arbor

Michigan, USA

Control of Aerospace Vehicles by Prof. Kolmanovsky, Graduate Student Instructor

Sept. 2020 - Dec. 2020

Mech-Mind (Beijing) Robotics Technologies

Beijing, China

Product Development Department, Intern

Dec. 2018 - Mar. 2019

Shanghai Jiao Tong University

Shanghai, China

Mechanical Behavior of Material, Teaching Assistant

Sept. 2018 - Nov. 2018

Chemistry Lab, Lab and Teaching Assistant

Mar. 2018 - May. 2018

Skills

Programming: C, Python, Pytorch, \LaTeX , Java and Arduino

Software & Platform: MATLAB, UG, Solidworks, Simulink, Abaqus