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
- Submitted to ICRA 2022, preprint at [https://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 (**submitted to RA-L**)* *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
- Submitted to RA-L, preprint at [https://arxiv.org/abs/???]

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