FENGJUN YANG

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EDUCATION

Ph.D. in Computer Science	Univerity of Pennsylvania	Sept. 2020 - Now
M.Sc. in Aerospace Engineering	Stanford University	Sept. 2018 - Jun. 2020
B.A. in Computer Science	Swarthmore College	Sept. 2014 - May 2018

RESEARCH PROJECTS

Distributed Control of Networked Systems using Graph Neural Networks *2020 - Present*
Mentor: Dr. Nikolai Matni *Philadelphia, PA*

- Developed a graph-neural-network-based algorithm for co-designing distributed controllers with their communication network. Implemented the algorithm in **PyTorch** and showed that our method achieves good control performance with sparser communication than traditional methods.
- Theoretically analyzed the performance of linear graph filter controllers on graph-symmetric systems. Designed and implemented (in **cvxpy**) an algorithm that sparsifies communication networks while maintaining performance guarantees.

Dynamics-Aware Trajectory Generation for Quadrotors *2022 - Present*
Collaborator: Anusha Srikanthan, Mentor: Dr. Igor Spasojevic, Dr. Nikolai Matni *Philadelphia, PA*

- Designed an algorithm with collaborators to learn a heuristics for generating quadrotor trajectories that are easy to execute for low-level controllers. Implemented the temporal-difference learning pipeline and solver for the trajectory optimization problem in Python using PyTorch and cvxpy.

Coordination of Robot Taxi Fleets using Model-Predictive Control *2019 - 2020*
Mentors: Dr. Matt Tsao, Dr. Ramon Iglesias, Dr. Marco Pavone *Stanford, CA*

- Developed an algorithm to coordinate robot taxi fleets by combining online model predictive controller with offline reinforcement-learned heuristics.
- Developed a pruning algorithm to sparsify road networks based on travel demands using network flow optimization. Implemented the algorithm in Python using **Gurobi** and **networkx**.

ENGINEERING PROJECTS

Turtlebot for Simulated Food Delivery (Stanford AA274 Final Project) 2019
Collaborator: Yueqi Wang, Junwu Zhang, Yanlong Ma *Stanford, CA*

- Implemented various parts of the autonomy stack (perception, SLAM, decision making, and trajectory planning) in **ROS** using both **Python** and **C++**. Implemented a customized visualization tool in Gazebo.

AWARDS AND HONORS

Stanford University Graduate Engineering Fellowship (5 quarters of tuition and stipend) *2018-2020*
Phi Beta Kappa, *Sigma Xi*, Swarthmore College *2018*
University of Tokyo Summer Research Fellowship (30 out of ∼1200 applicants) *2016*

SELECTED PUBLICATIONS

Fengjun Yang, Fernando Gama, Somayeh Sojoudi, and Nikolai Matni. *Distributed Optimal Control of Graph Symmetric Systems via Graph Filters*, IEEE Conference on Decision and Control (CDC), 2022

Carmen Amo Alonso*, **Fengjun Yang***, and Nikolai Matni. *Data-driven Distributed and Localized Model Predictive Control*, IEEE Open Journal of Control Systems, 2022

Fengjun Yang and Nikolai Matni. *Communication Topology Co-Design in Graph Recurrent Neural Network based Distributed Control*, IEEE Conference on Decision and Control (CDC), 2021

COURSEWORK AND SKILLS

Coursework: Mobile Robotics, Optimal Control, Model Predictive Control, Convex Optimization, Probability Theory, Computer Vision, Machine Learning, Reinforcement Learning, Multi-robot control

Skills: Python, C, C++, Matlab, OCAML **Languages**: Chinese, English, Japanese (JLPT N1)