ZETIAN ZHANG

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👥 EMPLOYMENT

SAIC Motor Innovation Center USA San Jose, CA   2019 Feb. - Present

Motion Planning Research Engineer

Lead development of motion planning module for L4 autonomous driving

- Formulated and implemented route planning and trajectory planning/optimization algorithm for L4 autonomous vehicles - related algorithm: A*, RRT*, iLQR, sequential convex programming
- Co-developed decision making algorithm/module for L4 autonomous vehicles to react traffic on road
- Co-developed vehicle motion prediction module
- Research and prototype state-of-the-art motion planning algorithms for autonomous driving
- Analyze log data, test algorithms in simulation environment, followed by benchmarking and validating the system with on-road testing
- No disengagement caused by motion planning module over 2000 miles in urban scenario on-road testing

Worcester Polytechnic Institute Worcester, MA   2013 - 2018

Research Assistant

Advised by Prof. Raghvendra V. Cowlagi

- Research focus on motion/task planning for autonomous vehicles
- Developed a hierarchical motion planning & task planning algorithms for multiple unmanned vehicles - path planning considering vehicle dynamics and to satisfy linear temporal logic specifications.
- Partnership with Aurora Flight Sciences (a Boeing Company) and delivered a path/task planner for fixed wing airplane.
- Teach Assistant: Optimal Control, Motion Planning, Statics, Fluid Dynamics, Formal Methods, etc.

SAIC Motor Innovation Center USA San Jose, CA   2018 May - 2018 Sept.

Research Intern

Path planning and decision making for L4 autonomous driving

- Formulated and implemented path/trajectory optimization algorithm
- Developed multiple decision making policies for autonomous driving in urban scenario

CoolChip Technologies Inc. Boston, MA   2014

Research Intern

Mentored by Dr. Lino Gonzalez

- Co-developed/designed and tested a cooling system for CPU of Xbox
- Cooling system computational simulation and tests

🎓 EDUCATION

Worcester Polytechnic Institute, Worcester, MA   2018 Sept.

Ph.D. in Aerospace Engineering, **GPA:** 3.93/4.0   **Research Focus:** Intelligent Motion Planning
M.S. in Mechanical Engineering, **GPA:** 4/4.0   **Research Focus:** Computational Fluid Dynamics

University of Shanghai for Science and Technology, Shanghai, China   2011 Aug.

Double *B.S.* in Energy and Thermal Engineering and Computer Science

Udacity Deep Learning Nanodegree   2018

🔖 Publication

- **Zetian Zhang**, Du Ruixiang, Raghvendra V. Cowlagi. Randomized Sampling-based Trajectory Optimization for UAVs to Satisfy Linear Temporal Logic Specifications. *Aerospace Science and Technology, 2020*
- Jie Fang, **Zetian Zhang**, Raghvendra V. Cowlagi. Decentralized Route-Planning for Multi-Vehicle Teams to Satisfy Temporal Logic Specifications. *IEEE Transactions on Automation Science and Engineering, 2019*
- **Zetian Zhang**, Raghvendra V. Cowlagi. A Fast Sampling-based Optimal Route-Planning Algorithm to Satisfy Linear Temporal Logic Specifications. *Guidance, Navigation, and Control Conference, 2018*
- Jie Fang, **Zetian Zhang**, Raghvendra V. Cowlagi. Decentralized Route-Planning to Satisfy Global Linear Temporal Logic Specifications on Multiple Aircraft. *Guidance, Navigation, and Control Conference, 2018*
- Raghvendra V. Cowlagi, **Zetian Zhang**. Route Guidance for Satisfying Temporal Logic Specifications on Aircraft Motion. *Journal of Guidance, Control, and Dynamics, 2016*
- **Zetian Zhang**, Raghvendra V. Cowlagi. Motion-planning with Global Temporal Logic Specifications for Multiple Nonholonomic Robotic Vehicles. *American Control Conference (ACC), 2016*
- Raghvendra V. Cowlagi, **Zetian Zhang**. Motion-planning with Temporal Logic Specifications for a Nonholonomic Vehicle Kinematic Model *American Control Conference (ACC), 2016*
- **Zetian Zhang**, Raghvendra V. Cowlagi. Incremental Path Repair in Hierarchical Motion-Planning with Dynamical Feasibility Guarantees for Mobile Robotic Vehicles *Control Conference (ECC), 2015 European.*

⚙ Skills

- Knowledge Base: motion planning, path planning, trajectory planning, behavior planning, trajectory optimization, autonomous driving, control theory, optimal control, model predictive control, formal methods
- Programming Languages: C++, Python, MATLAB
- Development: Linux, ROS, V-REP, Pytorch, OpenCV, SolidWorks, git
- Publication list and other projects on personal website: zetian.me