FANGJIAN LI

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SUMMARY

- PhD Candidate, Mechanical Engineering, Clemson University
- Highly capable in system dynamic modeling and control algorithm(Reinforcement learning (RL) algorithm, nonlinear control, and optimal control)
- Proven capability in programming language (Python, MATLAB, C++)
- Experienced in graphic user interface (GUI) design and human-in-the-loop (HITL) experiment design
- Familiar with Linux system and Shell commands

EDUCATION

Clemson University – SC, USA

Doctor of Philosophy in **Mechanical Engineering**, Ongoing (GPA 4.0)

- Machine Learning & Optimization
- Automated Vehicle System
- Modern Control Engineering
- Deep Learning
- Optimal Controls
- Analysis of Tracking System

Clemson University – SC, USA

Master of Science in **Automotive Engineering**, Aug 2016 (GPA 3.7)

- Automotive Electronics
- Vehicle Diagnostics
- Automotive Stability and Safety System
- Vehicle Control System Design
- Vehicle Testing
- Systems Integration Method

Hefei University of Technology - China

Bachelor of Science in **Automotive Engineering**, Jun 2014 (GPA 3.5)

- Basis of Control Engineering
- Automotive Dynamics
- Theory of automotive engine
- Construction of Automotive

RELEVANT PROJECTS

- **Safe Inverse Reinforcement Learning (IRL) in Driving Scenarios:** As a mentor, the human operator can teach autonomous systems how to drive safely. To reach this goal, a control barrier function-guided safe inverse reinforcement learning algorithm (CBF-guided safe IRL) is proposed. The human demonstrations are used in the IRL to train an autonomous driving policy. To improve safety, a CBF-guided safety critic neural network is built. Comparing to the typical safety critics, the CBF-guided safety critic can achieve much better training efficiency. Finally, the proposed algorithm has been tested by driving simulators with human-in-the-loop to show its effectiveness.
- **Cooperative Adaptive Cruise Control (CACC) Design:** Novel string stability criteria are given for the mixed traffic scenario. Based on the defined string stability, blending ratio optimal controller is design for CACC controller to improve the human comfort. Simulink and Carsim software were used to modeling the system and verify the design of this system.
- **Optimal Control, Pairing, and Scheduling for Manned-Unmanned Vehicles Teaming based on Robo-Trust Algorithms:** Trust is the key factor in human-robot interaction (HRI) area. Motivated by the need for quantitative trust measures and trust-based teaming for manned and unmanned vehicles, this project seeks to establish trust-based optimal switching control, dynamic pairing, and real-time scheduling algorithms for multiple manned and unmanned vehicles.
- **Design and Optimization of Electric Vehicle Powertrain System:** Based on the design objective, the structure as well as the parameters of electric vehicle powertrain system were designed. AVL Cruise software was used to simulate and verify its performance. Then, the parameters of vehicle powertrain system were optimized with a method of robust optimization.
- **2025 BMW MINI Hardtop Concept Car Design:** In the interior team, multiple functions have been designed to make 2025 MINI cooper a more connected and intelligent vehicle. The new technology and MINI customer experience is highly considered to bring about new driving experience.

PUBLICATIONS

- Li, Fangjian, "**Design and Optimization of Electric Vehicle Powertrain System**." ***(Outstanding Bachelor Thesis Award),*** Jun 2014
- Li, Fangjian, and Yue Wang. "**Cooperative Adaptive Cruise Control for String Stable Mixed Traffic: Benchmark and Human-Centered Design**." *IEEE Transactions on Intelligent Transportation Systems* 18.12 (2017): 3473-3485.
- Li, Fangjian, et al. **"Trust-based Control and Scheduling for UGV Platoon under Cyber Attacks"**, SAE Technical Paper. 2019.
- "**Human-Centered Time Headway Controller for Cooperative Adaptive Cruise Control (CACC)**." in the Proceeding of 97th Annual Meeting of the Transportation Research Board, Washington, D.C., January 2018. (**Co-author**)
- **"A Review of Intelligent Controller, Sensing and Communication, and Human Factors Aspects for Information-Aware Connected Automated Vehicles."** *IEEE Transactions on Intelligent Transportation Systems. 2019***. (Co-author)**

ACTIVITIES

Paper reviewer in the following conferences:

- The 2017 Dynamic Systems and Control (DSC) Conference, Tysons Corner, VA
- The 2018 American Control Conference, Milwaukee, WI
- The 2019 Conference on Advanced Intelligent Mechatronics (AIM), Hong kong, China
- The 2021 International Conference on Intelligent Robots and Systems (IROS), Prague, Czech Republic

Poster/Presentation presenter in the following conference:

- 23rd Annual Automotive Research Center Program Review, Ann Arbor, MI
- 24th Annual Automotive Research Center Program Review, Ann Arbor, MI
- 25th Annual Automotive Research Center Program Review, Ann Arbor, MI

Travel awardees in the following summer school:

- IEEE VTS Connected & Autonomous Vehicle Summer School, Worcester, MA

INTERNSHIP EXPERIENCE

BYTON automobile – Santa Clara, CA
Advanced Driver Assist System (ADAS) Engineer Co-op (3 Months) Jun – Aug 2018

- Help develop ADAS simulation using state-of-the art ADAS simulation software
- Develop sensor models, test environment and perform use case verification
- Evaluate and compare ADAS features (L0 through L3) KPI using simulation tools
- Update system requirement specification documents based on simulation results
- Support component and sub-system ADAS activities on test bench, HIL, LabCar

China Automotive Engineering Research Institute – Chongqing, China
Advanced Driver Assist System (ADAS) Engineer Co-op (3 Months) Jun – Aug 2015

- Working in the Intelligent Vehicle Testing and Evaluation Center
- Testing and evaluation of vehicle active safety system by using data acquisition system
- New ADAS testing system installment and calibration

SAIC-GM-Wuling Automobile – Qingdao, China
Process Engineer Co-op (2 Month) Jul – Aug 2013

- Deal with the problems reflected by the workers in assembly plant
- Check assembly parts for the new model