Dongfang Yang (杨东方)

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EDUCATION

The Ohio State University (OSU), Columbus, OH, United States

Ph.D. in Electrical and Computer Engineering	GPA: 3.98	2017.01 - 2020.12
M.S. in Electrical and Computer Engineering	GPA: 3.98	2015.08 - 2017.12

- Specialized in Autonomous Systems and Robotics

Sun Yat-sen University (中山大学), Guangzhou, Guangdong, China

B.E. in Micro-electronics (Embedded Systems)	GPA: 3.8	2010.09 - 2014.06

- Honor: 2014 Outstanding Graduate of Sun Yat-sen University

QUALIFICATIONS

- Knowledge: Computer Vision, Control Systems, Machine Learning, Robotics, Reinforcement Learning
- Specializations in autonomous driving: Perception, Prediction, and Planning
- Programming: Python, Matlab, C++, LaTex
- Frameworks: ROS, PyTorch, TensorFlow, OpenCV, Linux-Ubuntu
- Simulation Platforms: CARLA, Matlab-Simulink, PreScan, CarSim
- Hardware Experience: Nvidia-Drive platform, Velodyne LiDAR, ZED stereo camera, PointGray camera

RESEARCH PROJECTS

Synthesizing Autonomous Driving Images by Generative Adversarial Network   2020.04 - Present
- Compared SPADE and cycleGAN to synthesize realistic autonomous driving images from the semantic maps obtained in CARLA simulator.
- The synthesized images were evaluated by semantic retention using DeepLab-v3 and FID scores.

Object Detection for Autonomous Driving   2019.09 - Present
- Developed a frustum-based camera-LiDAR fusion algorithm specifically for far-away objects.
- Compared the algorithm performance based on 2D detectors of Yolo-v3 and Mask-RCNN with that of the state-of-the-art algorithms such as PointPillar and SECOND over Kitti Dataset.

A Framework for Vehicle-Pedestrian Interaction (VPI) in Pedestrian Crossing Scenarios   2019.08 - 2020.02
- Designed a framework for simulating the autonomous VPI at pedestrian crossing scenarios.
- Validated the use of the social-force pedestrian model by comparing MPC and PID vehicle control.

Motion Planning and Control for Autonomous Driving   2018.10 - 2019.08
- Simulated and compared various motion planning (RRT, A*, Lattice Planning) and control (MPC, Pure-Pursuit, Fuzzy Logic) algorithms for autonomous driving.
- Implemented the lattice planning algorithm to achieve a 10-mile autonomous driving demo.

Creating Trajectory Dataset for Complex Vehicle-Pedestrian Interaction (VPI)   2018.06 - 2019.06
- Published a dataset of two scenarios: (a) controlled fundamental VPIs and (b) campus shared space.
- Developed a trajectory extraction system to automate the data creation from bird-view videos.

Modeling and Simulation of Vehicle-Pedestrian Interaction   2017.07 - 2018.12
- Designed a social force based simulation model for all-purpose vehicle-pedestrian interaction.
- Fine-tuned the interaction model by conducting genetic algorithm calibration over realistic data.

WORK EXPERIENCE

Guangzhou Automobile Group R&D Center, Guangzhou, Guangdong, China   2019.05 - 2019.08
Intern of Algorithm at Workstation for Artificial Intelligence and Innovative Technology
-    Responsible for motion planning algorithm development for GAC's autonomous driving car.
-    Assisted the design of localization and control algorithms.

Dpt. of Foreign Language at Sun Yat-sen University, Guangzhou, Guangdong, China   2014.07 - 2015.07
System Administration Staff
-    Technical support of computer systems, networks, multimedia devices, and the website server in the department.

LEADERSHIP AND CURRICULAR ACTIVITIES
-    Volunteered in social activities for more than 200 hours   2010 - 2015
-    Served as president of Soccer Association at Sun Yat-sen University   2013 - 2014
-    An active member in Student Union at Sun Yat-sen University   2010 - 2012

PUBLICATIONS

Yang, Dongfang, Keith Redmill, and Ümit Özgüner. "A Multi-State Social Force Based Framework for Vehicle-Pedestrian Interaction in Uncontrolled Pedestrian Crossing Scenarios." accepted by *2020 IEEE Intelligent Vehicles Symposium (IV)*, Las Vegas, NV, United States, 2020.

Yang, Dongfang, Ümit Özgüner, and Keith Redmill. "A Social Force Based Pedestrian Motion Model Considering Multi-Pedestrian Interaction with a Vehicle." *ACM Transactions on Spatial Algorithms and Systems (TSAS)* 6, no. 2 (2020): 1-27.

Bao, Naren, **Dongfang Yang**, Alexander Carballo, Ümit Özgüner, and Kazuya Takeda. "Personalized Safety-focused Control by Minimizing Subjective Risk." In *2019 IEEE Intelligent Transportation Systems Conference (ITSC)*, pp. 3853-3858. IEEE, 2019.

Yang, Dongfang, and Ümit Özgüner. "Combining Social Force Model with Model Predictive Control for Vehicle's Longitudinal Speed Regulation in Pedestrian-Dense Scenarios." In *The 8th Biennial Workshop on Digital Signal Processing for In-Vehicle System*, Oct. 7th – 9th, 2018, Nagoya University, Japan, 8 pages.

Yang, Dongfang, Linhui Li, Keith Redmill, and Ümit Özgüner. "Top-view Trajectories: A Pedestrian Dataset of Vehicle-Crowd Interaction from Controlled Experiments and Crowded Campus." In *2019 IEEE Intelligent Vehicles Symposium (IV)*, Paris, France, 2019, pp. 899-904.

Yang, Dongfang, Ümit Özgüner, and Keith Redmill. "Social force based microscopic modeling of vehicle-crowd interaction." In *2018 IEEE Intelligent Vehicles Symposium (IV)*, pp. 1537-1542. IEEE, 2018.

Yang, Dongfang, John M. Maroli, Linhui Li, Menna El-Shaer, Bander A. Jabr, Keith Redmill, Füsun Özguner, and Ümit Özguner. "Crowd motion detection and prediction for transportation efficiency in shared spaces." In *2018 IEEE International Science of Smart City Operations and Platforms Engineering in Partnership with Global City Teams Challenge (SCOPE-GCTC)*, pp. 1-6. IEEE, 2018.

Yang, Dongfang, Arda Kurt, Keith Redmill, and Ümit Özgüner. "Agent-based microscopic pedestrian interaction with intelligent vehicles in shared space." In *Proceedings of the 2nd International Workshop on Science of Smart City Operations and Platforms Engineering*, pp. 69-74. ACM, 2017.