Bingyu Zhou

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Education

Master of Science | October 2017 | Delft University of Technology   **Delft, Netherlands**
· Major: Systems and Control
· GPA: 8.53/10
· Thesis: Probabilistic Motion Planning in Uncertain and Dynamic Environments [pdf]
· Advisor: Javier Alonso-Mora

Bachelor of Engineering | June 2015 | Zhejiang University   **Hangzhou, China**
· Major: Mechatronic Engineering
· Minor: Advanced Honor Class of Engineering Education, Chu Kochen Honors College
· GPA: 88/100, 3.9/4.0, Top 5%
· Thesis: Research of Optical Guidance for Docking Process of Autonomous Underwater Vehicle

Work & Research Experience

Software Developer at Siemens Corporate Technology | Erlangen   **09, 2017 - present**
- Develop the decision making algorithms to achieve the optimal performance of battery storage systems interacted with renewable energy source, real time grid and varied consumption pattern for residential and industrial customers, such as minimization of electricity bills, maximization of energy autarchy and swarm intelligence.
- Investigate deep reinforcement learning algorithms in optimal control of the large scale energy distribution systems. Focus on the generalization and stability problem for highly stochastic environment and tight real-time control requirement.
- Responsible for algorithm maintenance and updating of Siemens residential energy storage product, Junelight. And the research of modeling and forecasting PV and consumption patterns using LSTM based on customers' cloud data.

Probabilistic Motion Planning in Uncertain and Dynamic Environments | Delft   **08, 2016 - 10, 2017**
- Designed the motion planning algorithm for ego-vehicle's autonomous navigation at intersection scenario under the uncertainty of other vehicles' future motion.
- Extended the Model Prediction Control method with chance constraints by modeling obstacle vehicles' uncertain future motions as mixture Gaussian distributions to incorporate the motion uncertainty. Deployed online POMDP framework to model the decision making process of obstacle vehicles.
- Implemented multipolicy MPC at mobile robot Jackal via a numerical optimization library FORCES and solved the online POMDP via the modified DESPOT solver in C++. Integrated the whole decision making system in a ROS simulator.

Optimal Vehicle Dynamic Control Based on SDRE | Delft   **03, 2016 - 06, 2016**
- Built up the nonlinear vehicle model including longitudinal, lateral and load transfer dynamics in Simulink.
- Successfully designed the SDRE nonlinear controller to stabilize the yaw and lateral motion based on the state-dependent coefficient form. Tested the controller using sine with dwell maneuver for different vehicle velocity in simulation.

Motion Control of Quadruped Robot Zebro | Delft   **03, 2016 - 06, 2016**
- Created the path following controller based on unicycle model to avoid collision in virtual environment. Implemented the gait controller for two robots to realize the synchronization and switching gaits function.

- Successfully finished the rescue scenario test (steering robots to desire location, synchronizing two robots to lift a bridge, climbing stairs and climbing rough terrains) in V-rep simulation. Top 5 among 25 teams.

International Time Series Forecasting Competition | Delft   **02, 2016 - 04, 2016**
- Took part in the IEEE forecasting competition with the other two students. Designed an ARX model and a three-hidden-layer neural network to train the forecasting model in Matlab and Python. The forecasting error for the 72 varied horizon time series was 0.105.
- Improved the deep feedforward neural network by the LSTM network combined with classic statistic analysis in Tensorflow. The final error was reduced to 0.093.

3D Robot Vision | Delft   **11, 2015 - 01, 2016**
- Implemented the pose estimation based on the homography geometry. Ransac algorithm was used to identify the homography matrix which described the projection relationship between stereo images.
- Implemented the Levenberg-Marquardt algorithm to solve the bundle adjustment problem.

Extra-Curricular Activities

Volunteer for International Robotics Week | Den Hague & Delft   **Apr. 19 - Apr. 21, 2017**
Volunteered to organize the Grand Opening for the first International Robotics Week hosted by RoboVally and responsible for the technical arrangement and Q&A session.

Teaching Assistant of Master Course Predictive & Adaptive Control | Delft   **03, 2017 - 06, 2017**
Assisted the lecturer with the preparation and guidance of the coding assignment for the course with more than 30 students. Presented a 45-mins lecture about the control theory behind the coding assignment.

Publications

Joint multi-policy behavior estimation and receding-horizon trajectory planning for automated urban driving

Bingyu Zhou, Wilko Schwarting, Daniela Rus, Javier Alonso-Mora

ICRA 2018, Brisbane [pdf] [presentation]

Adaptive path following for Unmanned Aerial Vehicles in time-varying unknown wind environments

Bingyu Zhou, Harish Satyavada, Simone Baldi

2017 American Control Conference, Seattle [pdf] [slide]

Awards & Scholarship

Justus en Louise van Effen fonds Foundation Scholarship | TU Delft   **2015 – 2017**
Excellent scholarship for master education, one candidate each faculty

Eaton Intern Scholarship | Eaton (China) Co., Ltd.   **09, 2014**
Corporate scholarship for excellent performance during internship

Technical Skills

Programming Languages: C++, Python, Matlab/Simulink

Software tools: ROS, Tensorflow, Git, CMake