KAI-CHIEH MA

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EDUCATION

University of Southern California (USC), California, USA Aug 2015 – May 2017
Master of Science in Computer Science (Intelligent Robotics), **Distinguished Student Award** GPA: 3.8/4.0

National Taiwan University (NTU), Taipei, Taiwan Sep 2008 – Jun 2012
Bachelor of Computer Science & Information Engineering (CSIE) Rank: 39/105

WORK EXPERIENCE

TuSimple San Diego, USA
Robotics Software Engineer July 2017 – Present

- Worked on planner software system for autonomous trucks in highway scenarios
- Designed and developed state machines for autonomous driving decision making system
- Researched and implemented optimization-based motion planning algorithms for trajectory generation
- Hands-on experience on level-4 autonomous car/truck road tests on highways

USC Robotic Embedded Systems Laboratory (Advisor: Lantao Liu) (Director: Gaurav S. Sukhatme) USA
Research Assistant Oct 2015 – May 2017

- Researched on route planning and learning for aquatic vehicle in unstable and unknown aquatic field
- Designed and implemented "Informative Planning and Online Learning" using ROS (Robot Operating System) on an autonomous boat and did experiments on actual environment
- Published 3 conference papers as first author on ICRA 2017, IROS 2016, and DARS 2016

Cyberlink Corp. (Full-time) Taipei, Taiwan
Software Engineer, RD-ME-PowerDVD (19 team members) Aug 2012 – Mar 2014

- Developed PowerDVD 12, 13, 14 products (PowerDVD 12/13 Taiwan Excellence Award 2013/2014)
- Handled PowerDVD specification requests from OEM clients within tight schedule (HP, Dell, Lenovo, etc.)

PROJECT EXPERIENCE

Multi-Robot Simultaneous Localization and Mapping (SLAM) Nov 2016

- Implemented particle-based FastSLAM2.0 for landmark-based mapping and 2D mobile robot localization
- Extended the particle filter to multi-robot SLAM with unknown initial poses
- Estimation of robot motion and measurement model parameters using maximum likelihood estimation
- Used C++ and ROS for the system implementation and visualization

Machine Learning: Santander Customer Satisfaction Competition Apr 2016

- 3rd place among all groups (21) in the class and 566th out of 5236 groups participating the competition
- Solved supervised binary classification using gradient boosting and decision trees

RoboCup Standard Platform League (5 team members) 2012, 2014

- Represented from NTU Robot Perception and Learning Lab and made to top 12 in the competition in 2012
- Devised goal post & soccer ball object recognition algorithms
- Applied sonar-based Occupancy Grid Mapping for obstacle detection
- Implemented robot-to-robot (4 robots) communication via Wi-Fi
- Revised goal post detection for new rules in 2015 RoboCup (2014)
- Researched on motion planning under Partially Observable Markov Decision Process (POMDP) (2014)

Extended Kalman Filter Localization Dec 2011 – Feb 2012

- Solved localization problem for mobile robot in real environment
- Implemented line feature extraction via Hough Transform based on 2D-laser data points
- Associating features with given map features to achieve robot pose correction

Mobile Robot (Pioneer 3DX) Maze Exploration (3 team members) Dec 2010 – Feb 2011

- Accomplished simple version of simultaneous localization and mapping problem
- Adopted closed-loop feedback control system to avoid bumping into walls
- Implemented uniform cost search algorithm to find the shortest path for the second run of the maze

SKILLS

Language: C++, Python, Matlab, Java, LaTeX **Tools:** ROS, OpenCV, Git, SVN, Linux, Docker, AWS, CI
Skills: Robotics, Motion Planning, State Estimation, Markov Decision Process, Machine Learning, Computer Vision