

# WEI DU

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## EDUCATION

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- Carnegie Mellon University (CMU)** *08/2017 - 05/2019*
- M.S. in Mechanical Engineering
  - GPA: 3.89/4.0
- Shanghai Jiao Tong University (SJTU)** *02/2016 - 06/2016*
- Mechanical Engineering (Joint Program)
  - GPA: 3.83/4.3
- Harbin Institute of Technology (HIT)** *08/2013 - 06/2017*
- BEng in Mechanical Design, Manufacturing and Automation
  - GPA: 3.76/4.00

## RESEARCH EXPERIENCE

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- Multi-Resolution A\* algorithm – Search-based Planning Lab (CMU)** *06/2019 - Present*
- Research on initializing multiple searches simultaneously in one search-based planner to explore search spaces in different resolutions.
  - Exploited different scheduling policies.
  - Highly increased the success rate of planners and accelerated the search drastically.
- Walker Project – Search-based Planning Lab (CMU)** *04/2019 - Present*
- Executing SLAM algorithms on Walker robot for its indoor navigation.
  - Implementing ARA\* algorithm on Walker robot for manipulation tasks.
  - Constructing perception-planning-grasp pipeline for grasping tasks, e.g., grasp a box from conveyor.
- CruzeR Project – Search-based Planning Lab (CMU)** *10/2018 - 04/2019*
- Responsible for SLAM module on CruzeR humanoid robot.
  - Constructed a state machine coordinating and SLAM.
  - Constructed a local controller to follow the trajectories returned by planner.
- Planning Using Soft Duplicate Detection – Search-based Planning Lab (CMU)** *12/2017 - 02/2019*
- Exploring search-based planning approaches in continuous state space with soft duplicate detection scheme.
  - Implemented machine learning techniques in penalizing states and map pattern recognition.
  - Wrote a program in visualizing planning process.
- Quad-rotor Trajectory Optimization – the Robotics Institute (SJTU)** *05/2016 - 06/2016*
- In charge of quad-rotor trajectory planning with dynamic constraints by using optimization techniques.
  - Adopted differential smoothing algorithm to reduce jitter.
- Small Wheeled Jumping Robot – Lab of Advanced Actuation Technologies (HIT)** *08/2015 - 01/2016*
- Designed cellular wheel structure and conducted force analysis on it.
  - Completed circuit design of single chip microcomputer based on STM32 minimum system board.
  - PID controller implementation.
- Nation College "Freescale Cup" Smart Car Contest** *09/2014 - 04/2015*
- Applied PID controller, Kalman filter and used Labview software to simulate and analyze the performance of the smart car.

## COURSE PROJECTS

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- Power plant Substation-to-feeder Path Prediction – Bayesian Machine Learning** 02/2019 - 05/2019
- Worked with Kevala company on predicting feeder-path endpoints by CNNs.
  - Employed motion planning algorithms in generating the substation-to-feeder paths.
- Offline Hand-written Chinese Characters Recognizing – Pattern Recognition Theory** 09/2018 - 12/2018
- Implemented CNNs in recognizing hand-written Chinese characters.
  - Implemented decision-trees, SVM as baselines against CNNs in recognizing hand-written Chinese characters.
- Inserting A Curve Into Mesh – Advanced Engineering Computation** 03/2018 - 05/2018
- Work on 2D mesh loading and rendering with OpenGL Library.
  - Reproduced the work of one research paper about inserting a curve into one mesh figure in order to increase the smoothness on the edges between different components of this figure.
- Aviation Game – Engineering Computation** 09/2017 - 12/2017
- Designed a GUI for an aviation simulator.
  - Achieved the basic functionality of an aviation game including control model of an airplane based on kinematics and dynamics.

## ACTIVITIES

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- Visitor, HIT Robot Group Inc.** 07/2015
- Technical communications on combination of production and academia research about industrial robots.
- Volunteer, HIT Library** 02/2014 - 07/2014
- Provided consultation services to students.
  - Worked with librarians on book organization system.
- Member, Charitable Association to Transmit Childhood** 09/2013 - 01/2014
- Planned and participated in public service activities for children with autism.
  - In charge of designing activities and games that benefits the mental health of autistic children.

## HONORS & AWARDS

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- People's Scholarship in China for three consecutive years 12/2013 - 12/2015
- SMC Scholarship 09/2015
- 2nd Prize in Nation College "Freescale Cup" Smart Car Contest 04/2015
- Shanghai Huiyi Scholarship 09/2014
- 2nd Prize in annual project at HIT 09/2014

## PUBLICATIONS

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- Wei Du, Fahad Islam and Maxim Likhachev. *Multi-Resolution A\**. (under review)
- Wei Du, Sung-Kyun Kim, Oren Salzman and Maxim Likhachev. *Escaping Local Minima in Search-Based Planning using Soft Duplicate Detection..* (IROS 19')
- Wei Du and Yingxiang Liu.(2017). Design on Test System and Experimental Research of Foot Piezoelectric Ultrasonic Motor. School of Mechatronics Engineering, Harbin Institute of Technology, Harbin, China.