

# ChaoLiu

Robotics Researcher

## contact education

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Sept '12 - May '14

**Master** of Science in Engineering in Robotics  
*School of Engineering & Applied Science, University of Pennsylvania*

3.61/4.00

Sept '08 - June '12

**Bachelor** of Science in Mechanical Engineering and Automation  
*School of Mechanical Engineering, Dalian Jiaotong University*  
Specialization in Mechatronics, Minor in Business Administration

89.5/100

## projects

### languages

Chinese (native)  
English (professional)

### courses

Learning in Robotics,  
Machine Learning,  
Digital Signal Processing,  
Embedded Systems,  
Control,  
Mechatronics

### strengths

Embedded Systems,  
C/C++, Python, Matlab,  
Control, Motors,  
PCB (Eagle, Altium),  
CAD (SolidWorks)  
Git, SVN

Mar '14 - Apr '14

#### Localization and Mapping(SLAM)

Simultaneous Localization and Mapping

- Leveraged mobile-robot-mounted IMU and LIDAR to map indoor environment;
- Constructed 2D map using a particle filter and occupancy grid algorithm.

Nov '13 - Dec '13

#### PhanToM Robot Control System(Our Own Myo)

Mechatronics and Machine Learning

- Designed wearable device using IMU and EMG(read muscle signals) to measure muscle activation and motion to control robots;
- Designed mobile robot with Omni-wheels and holonomic control;
- Designed board with IMU, xBee and low-level PID controller for a quadrotor.

Nov '13 - Dec '13

#### Yelp Rating Prediction

Machine Learning

- Processed user reviews with NLP methods to classify the words;
- Used Naive Bayes, SVM and custom kernel to train and build model.

July '13 - Aug '13

#### Persona Robot

Mechatronics and Control

- Designed infrared-based force sensor and associated PCB;
- Implemented servo controller for tablet-driven motor;
- Designed PID controllers for base motion and mast rotation.

Feb '13 - Mar '13

#### M4 Peripheral Design -- mTouch

Embedded Systems

- Used FT5306 controller for capacitive touchscreen;
- Designed the interface PCB and code for STM32F373(Cortex-M4) via IIC.

Dec '12 - June '13

#### Low-cost Laser Range Finder

Embedded Systems

- Simulated SCCB protocol on STM32F373(Cortex-M4) and configured the camera(OV7670) in Raw RGB mode with VGA resolution;
- Designed the PCB including microcontroller, camera and laser;
- Transmitted the data to the master via SPI.

Nov '12 - Dec '12

#### Robockey

Mechatronics

- Competed in 3-on-3 hockey played by fully-autonomous robots;
- Localized robots with infrared cameras and applied wireless communication;
- Designed PD controller to capture puck and move toward goal;
- Integrated solenoid for "shooting".

## working experiences and organizations

Oct '12 - Now

#### Research Assistant in ModLab (UPenn GRASP Laboratory)

Robotics

Focus on Embedded Systems Design and Control (Low-cost Laser Range Finder, Persona Robot and SMORES Electronics)

Aug '13 - Dec '13

#### Teaching Assistant for Design of Mechatronics Systems (MEAM 510)

Mechatronics