

ChaoLiu

Robotics Researcher

contact education

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languages

Chinese (native)
English (professional)

courses

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

strengths

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

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

June '14 - Sept '14

SMORES Electronics

Electronics

- Designed main CPU board with STM32F303(Cortex-M4), including JTAG interface, IIC interface, SPI interface for a Wifi chip and motor drivers;
- Designed face board with ATmega88a, coil-driving circuit by MOSFETs, coil communication circuit with a RF Power Detector and 2 ADCs for encoders.
- Designed programming environment for AVR microcontrollers in Unix and Windows and implemented basic libraries for STM32F303 and ATmega88a.

Apr '14 - Apr '14

Cost Learning and Path Planning

Robotics and Machine Learning

- Built a route planner for the Penn campus;
- Selected features based on an aerial photograph and implemented reinforcement learning method to learn the cost associated with each feature;
- Used Dijkstra's algorithm to find the optimal path.

Mar '14 - Apr '14

Localization and Mapping(SLAM)

Robotics and Machine Learning

- 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.

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.

working experiences and organizations

Oct '12 - Now

Research Assistant in ModLab (UPenn GRASP Laboratory)

Robotics

Focus on Embedded Systems Design and Control

Aug '13 - Dec '13

Teaching Assistant for Design of Mechatronics Systems (MEAM 510)

Mechatronics