ChaoLiu

Robotics Researcher

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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

education

Sept '12 - May '14 — **Master** of Science in Engineering in Robotics — 3.61/4.00
School of Engineering & Applied Science, *University of Pennsylvania*

Sept '08 -June '12 — **Bachelor** of Science in Mechanical Engineering and Automation — 89.5/100
School of Mechanical Engineering, *Dalian Jiaotong University*
Specialization in Mechatronics, Minor in Business Administration

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.
- Implemented basic libraries for STM32F303 and ATmega88a.

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.

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 for motor and 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