Lin Shijie

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Education

Wuhan University, Hubei, China *Sep. 2017 -- Jul. 2019*
M. Eng. in Electronics Engineering (**EE**); Exam-Free Student; **GPA:** 85.9/100 | 3.3/4.0
Keio University, Tokyo, Japan *Feb. 2017*
Exchange Student; Keio Entrepreneurship Program
Sichuan University, Sichuan, China *Sep. 2013 -- Jul. 2017*
B.Eng. in Electronics and Information Engineering (**EE**); **GPA:**84.7/100 | 3.29/4.0; **Rank:** 6/121

Research Interests

Machine vision, learning in robot, Simultaneous Localization and Mapping(SLAM) and multisensor fusion.

Publications

Paper

1. **S. Lin**, J Wang, R. Peng, W. Yang. "Development of an Autonomous Unmanned Aerial Manipulator Based on a Real-Time Oriented-Object Detection Method." *Sensors*. (**Under revision**)
2. H. Yu, **S. Lin**, J Wang, K. Fu, W. Yang. "An Intelligent Unmanned Aircraft System for Wilderness Search and Rescue." *International Micro Air Vehicles Conference and Flight Competition(IMAV)*, 2017. (**Oral**)
3. X. Wang, Y. Du, **S. Lin**, P. Cui, Y. Shen, Y. Yang. "adVAE: a Self-adversarial Variational Autoencoder with Gaussian Anomaly Prior Knowledge for Anomaly Detection." *Knowledge-Based Systems* (**Under review**)

Patents(5 in total)

1. **S. Lin**, W. He, H. Yu, W. Yang. A Multifunctional Unmanned Aerial Vehicle for Field Search and Rescue.
   Patent No. CN206926823U, *Jul. 2017*
2. **S. Lin**, H. Zhao, F. Jiang, P. Xue, S. Li, Z. Guo. Dot matrix type braille dot display touch control screen.
   Patent No. CN106775123A, *Jan. 2017*
3. J. Huang, X. Wang, **S. Lin**, *et al*. Pull-type braille display device and component reuse method.
   Patent No. CN106781881A, *Jan. 2017*

Research Experiences

Research Assistant, supervised by Prof. Weng Yang *Sep. 2017 -- Present*
Signal Processing Lab(SPL), Wuhan University, China

- Research: **Autonomous Unmanned Aerial Manipulator(UAM)**
  - Proposed Rotation-SqueezeDet(**RSD**), an algorithm based on light convolutional neural network(CNN) and can detect objects with **rotation angles** in **real-time**. Build a complete UAM system from scratch and use proposed detection algorithm to enable **rotation-aware grasping**. Paper is submitted to a journal.
- Research: **An Efficient Normalization Method for Event-Camera on Surface of Activate Events.**
  - **Proposed 4 different efficient normalization method** for Local and Global normalization, all are under $O(n)$ time complexity(traditional methods are $O(nlogn)$). **Proposed a novel calibration method** to find latency of event-camera, using **RANCAS** and **least squares**. **Proposed latency tolerance** can largely increased both accuracy and efficiency of event normalization. Paper is planing to submit to top AI conference(3DV).
- Competition: **ICRA2018 DJI Robomaster AI Challenge(Global Rank: 6/70)**
  - Build **two fully autonomous** combat robots from scratch. Designed a **2D-3D tracking framework** using **machine vision** and **image/PointCloud processing**. Adopted kalman filter to process sensors' feedback as odometry.
  - Keywords: UKF, Navigation, Detection, Tracking, Communication, Strategy, Maps Dimension Reduction.
- Thesis: **Autonomous Tunnel Inspection Using an UAV**
  - Exploited **point cloud processing** and **RANSAC fitting** methods for tunnel perception to eliminate drift error.

Lab Member, supervised by Prof. Hui Zhao and Prof. Jiaping Xu. *May. 2014 -- May. 2017*
Student Innovation Lab, Sichuan University, China

- Project: **Multi-node Intelligent Access Control System**
  Supported by **National Undergraduate Training Programs for Innovation (20000RMB)**
  - Nodes can automatic networking and sense surrounding. Knowing conditions of a building using data analysis.

- Project: **Smart Lattice Braille Reader**
  Won the 1^{st} **prize** of **Microsoft Imagine Cup 2016 Global Students Technology Competition**
  - Proposed and build a universal braille reader. Designed PCB circuit can handle multiple braille touch units.
  - Keywords: Touch Signal Processing, Azure Cloud, Multi-platform Data Transmission, Two Patents.
- Competition: **National Undergraduate Electronic Design Competition**
  - Developed algorithms of autonomous drone control with **machine vision**. Tracking lines and junctions as visual feedback. Medium filter and cascade PID controller are implemented in microcontrollers for robust flying.
- Thesis: **Pedestrian Detection Under UAV Perspective**
  - Analyzed multiple SVM-based and CNN-based detection methods. Improved the SSD for pedestrian detection.

Other Experiences

- Attend the **Summer School of Simultaneous Localization and Mapping(SLAM)** held by CAD&CG State Key Lab, Zhejiang University. Zhejiang, China. *Jul. 2018*
- Attend the **IEEE International Conference on Robotics and Automation(ICRA)** 2018, Brisbane, Australia. *May. 2018*
- Attend the **Workshop of Aerial Robotic Inspection and Maintenance: Research Challenges, Field Experience and Industry Needs** in ICRA 2018, Brisbane, Australia. *May. 2018*
- Attend the **Seminar of Frontier Deep Learning Research** held by China Computer Federation(CCF) and Huazhong University of Science and Technology(HUST). Hubei, China *Nov. 2017*
- Attend the **9th International Micro Air Vehicles Conference**, Toulouse, France. *Sep. 2018*

Honors and Awards

Scholarship:(7 in total)

National Scholarship for Postgraduate **(TOP 1%)** *Oct. 2018*
1^{st} Prize , Postgraduate Academic Scholarship of Wuhan University**(TOP 5%)**(Twice) *Sep. 2017 & Sep. 2018*
1^{st} Prize, Postgraduate Entrance Scholarship of Wuhan University**(TOP 5%)** *Oct. 2017*
1^{st} Prize, Outstanding Scholarship of Sichuan University**(TOP 5%)** *Oct. 2016*

Competition:

1^{st} Prize & Best paper, National Postgraduate Electronic Design Competition**(5/2437, TOP 0.2%)** *Aug. 2018*
Finalist Prize, ICRA2018 DJI Robomaster AI Challenge**(Global: 6/70)** *May. 2018*
1^{st} Prize, Microsoft Imagine Cup 2016 Global Students Technology Competition(China, **TOP 1%)** *Apr. 2016*
1^{st} Prize, National Undergraduate Electronic Design Competition**(TOP 1%)** *Aug. 2015*

Others:

1^{st} Prize, Excellent Undergraduate Thesis of Sichuan University *Jun. 2017*
Outstanding Academic Student Group Leader of Sichuan University(Twice) *Jul. 2015 & Nov. 2014*

Skills

Research Related:

- **Machine Learning:** Tensorflow, PyTorch, Scikit-Learn, OpenCV, PCL(Point Cloud Library), *etc*.
- **Mathematics:** Calculus, Linear Algebra, Probability, Statistics, Numerical Analysis, Optimization, *etc*.
- **Robotics:** Linear & Non-linear Control, Robot State Estimation, Newton–Euler Modeling, *etc*.

Programming Related:

- **Languages:** C/C++, Python, MATLAB, LaTeX, *etc*.
- **Development:** Git, Shell, Robot Operating System(ROS), Linux, ARM Platform, *etc*.
- **Tools:** Solidworks, Altium Designer, LabVIEW, VSCode, Cura, Keil, Drill/Hammer/Screwdriver/Saw, *etc*.
- **Hardware:** Jetson TX1/TX2, 8051/ARM/X64/X86 Platform, APM/PX4/Pixhawk, DJI Drones/Robot, Structure/Circuit/PCB Design, 1D/2D/3D Rangefinder, RGBD/RGB/Event/Infrared Camera, IMU, *etc*.

English

- **TOEFL iBT:** 92 (Reading - 25, Listening - 24, Speaking - 23, Writing - 20)

Leadership

President, Electronic Creative Club, Sichuan University *Sep. 2014 -- Jun. 2016*

- Managed the Student Innovation Lab in School of Electronic Engineering with several club members.
- Organized multiple campus-wide academic seminars and technical robot competition.