Zuxin Liu

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EDUCATION

Beihang University *Beijing, China*
B.Eng. in Technology and Apparatus of Measuring and Control *Sep. 2015 – Jun. 2019(expected)*
GPA: 3.94/4.00, 1/167 (Cumulative Rank)

- National Scholarship (top1%), 2016&2017&2018
- China Instrument Society First Class Scholarship (top0.2%), 2018
- Dean's Award (top1%), 2017
- First Class of Scholarship (top1%), 2016&2017

Darmstadt University of Technology *Darmstadt, Hessen, Germany*
Exchange Student at the Computer Science Department *Sep. 2018 – present*

- Fully funded by the China Scholarship Council
- Ongoing courses: Computer Vision; Robot Learning (Lecture, Seminar, Project Lab)

PUBLICATIONS

Chao Y., **Zuxin L**. et al. (2018). DS-SLAM: A Semantic Visual SLAM towards Dynamic Environments. International Conference on Intelligent Robots and Systems (IROS), 2018 IEEE/RSJ International Conference. paper
Zuxin L. et al. (2019). Where Should We Place LiDARs on the Autonomous Vehicle? – An Optimal Design Approach. 2019 IEEE International Conference on Robotics and Automation (ICRA). (submitted) paper
Chao Y., **Zuxin L**. et al. (2019). Dense-WVLAD: A CNN feature based loop closure detection method. 2019 IEEE International Conference on Robotics and Automation (ICRA). (submitted)

RESEARCH EXPERIENCE

Darmstadt University of Technology *Darmstadt, Hessen, Germany*
Supervisor: Prof. Jan Peters & Dr. Riad Akrour *Sep.2018 – present*
Project 1: Write a book chapter of the reinforcement learning (May be published on Springer)

- Conduct deep and comprehensive survey on the model predictive control in the reinforcement learning field

Project 2: Project lab: application of reinforcement learning methods

- Implement the DQN and MPC algorithms from scratch and thoroughly evaluate them on the Cart-pole, Double-cart-pole and Furuta Pendulum robot platforms

Carnegie Mellon University *Pittsburgh, Pennsylvania, USA*
Supervisor: Prof. Ding Zhao *Jul. 2018 – Sep. 2018*
Project 1: An Optimal LiDAR Configuration Approach for Self-Driving Cars

- Independently investigated the optimal LiDAR space configuration problem to achieve the maximum utility of the sensor. The whole problem is formulated as an optimization model and a bio-inspired metric is proposed as the cost function
- Paper has been submitted to 2019 ICRA

Project 2: Autonomous Vehicle Platform Design
- Help to design and develop a 6-DOF attitude control system based on a 3-axis gimbal and a 3-axis linear slider

Tsinghua University *Beijing, China*
Supervisor: Prof. Fei Qiao *Sep. 2017 – Jul. 2018*

Project 1: DS-SLAM: A Semantic Visual SLAM towards Dynamic Environments
- Employed semantic segmentation neural network to improve Simultaneous Localization And Mapping (SLAM) robustness in dynamic environments
- Paper has been accepted by 2018 International Conference on Intelligent Robots and Systems (IROS) with oral presentation (one of the most popular presentations at IROS 2018 ranked by INFOVAYA)

Project 2: Dense-WVLAD: A CNN feature based loop closure detection method
- Used CNN feature to address loop closure detection problem in autonomous robot field
- Paper has been submitted to 2019 ICRA

ACADEMIC EXPERIENCE

Beihang University *Beijing, China*
Supervisor: Prof. Zhenzhong Wei *Sep. 2016 – Jul. 2018*

Project 1: Robot's Eyes and Brain: Visual Semantic SLAM System
- National Undergraduate Training Program for Innovation and Entrepreneurship
- Led a team to enable the robot finish high-level tasks autonomously (eg. The robot could understand user's voice instructions and help the user to find objects)
- Won the **First Prize** in the 2018 International Conference on Optics and Photonics(ICOPEN) 3-D Sensor Application Design Competition (1 out of 20 teams around the world)
- Won the **First Prize** in the 28th Feng Ru Cup Competition of Academic and Technological Works (top1%)

Project 2: VR Multicopter System
- Invented a muticopter system which could let user control the drone in the first person perspective
- Won the **First Prize** in the 2017 International Design and Innovation Competition (1 out of 14 teams around the world)

Project 3: Visual SLAM-based Autonomous Robot
- Led a team to build a mobile robot platform which could achieve autonomous navigation and obstacle avoidance based on RTAB-Map and ROS
- Won the Second Prize in the 27th Feng Ru Cup Competition of Academic and Technological Works (top15%)

Project 4: Arduino-based Interactive Facial Expression Robot

- Independently developed a servo control-based robot which could make different expressions according to user's voice command
- Won the Third Prize in the 26th Feng Ru Cup Competition of Academic and Technological Works (top30%)

Da-Jiang Innnovations (DJI) *Shenzhen, China*
Algorithm Engineer Intern in the RoboMaster Department *Jul. 2017 – Aug. 2017*
- Co-designed an automatic AI robot system which is developed for 2018 ICRA DJI RoboMaster AI challenge
- Developed the localization module based on the LiDAR SLAM
- Developed the enemy detection module based on computer vision

TEACHING EXPERIENCE AND LEADERSHIP

Students' Union of Beihang University
Head of Science Technology Department *Sep. 2016 – present*
- In charge of the organization and training of scientific and technological events

School of Instrumentation and Optoelectronic Engineering
Freshmen's Mentor *Sep. 2016 – present*
- Gave a series of lectures to teach students how to build a robot
- Held a relevant smart robot competition for students

OTHER GRANTS & AWARDS

National Undergraduate Training Program for Innovation, CNY 10000 2018
Beihang University
Beijing Outstanding Student 2018
Ministry of Education of Beijing
Honorable Mention 2018
The Interdisciplinary Contest in Modeling
The 2nd Prize in Beijing Physics Competition 2016
Beijing Society of Physics
University-level Outstanding Student 2016&2017&2018
Beihang University
University-level Excellent Member 2016&2017
Beihang University

SKILLS & TECHNIQUES

Programming: Python, C++, C, Julia, MATLAB
Software: Solidworks, Multisim, PS, PR, AE
Others: Proficient in Linux, ROS, Arduino, STM32; Knowledge of robotics, computer vision and machine learning