# Zuxin Liu

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## EDUCATION

**Beihang University** *Beijing, China*
*B.Eng.* in Technology and Apparatus of Measuring and Control *Expected June 2019*
GPA: 3.86/4.00, 3/167 (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, Germany*
Exchange Student at the Computer Science Department *September 2018 – present*

- China Scholarship Council Full Scholarship

## 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.
**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

**Carnegie Mellon University** *Pittsburgh, Pennsylvania, USA*
Research Assistant with Prof. Ding Zhao *July 2018 – August 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*
Research Assistant with Prof. Fei Qiao *September 2017 – July 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*
Research Assistant with Prof. Zhenzhong Wei *September 2016 - present*
**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 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 Summer 2017
- Co-designed an automatic AI robot system which is developed for 2018 ICRA DJI RoboMaster AI challenge
- Developed the localization module based on laser SLAM and ROS

- Developed the enemy detection module based on computer vision

## TEACHING EXPERIENCE AND LEADERSHIP

**Students' Union of Beihang University**
Head of Science Technology Department 09.2016-Present
- In charge of the organization and training of scientific and technological events

**School of Instrumentation Science & Opto-electronics Engineering**
Freshmen's Mentor 09.2016-Present
- Gave a series of lectures to teach students how to build a robot
- Held a relevant smart robot competition for students

## 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
Beihang University
**University-level Excellent Member** 2016&2017
Beihang University

## SKILLS & TECHNIQUES

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