**Zuxin Liu**

[xinye@buaa.edu.cn](mailto:xinye@buaa.edu.cn) ▪ (+86) 13681210321

No. 37 Xueyuan Road, Haidian Distrinct, Beijing, China 100191

**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](https://arxiv.org/abs/1809.08379)

**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](https://arxiv.org/abs/1809.05845)

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](https://events.infovaya.com/))

**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