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Education

South China University of Technology (SCUT), Guangzhou, China
Master of Engineering in Control Science and Engineering • expected 06/2022
- GPA: 89.44/100; Ranking: 1/85
- Selected Courses: Optimization Method, Analysis of Matrix, Linear System Theory, Image Analysis, Artificial Neural Networks and Their Applications

Beijing Forestry University (BJFU), Beijing, China
Bachelor of Engineering in Electrical Engineering and Automation • 06/2019
- GPA: 92.65/100; Ranking: 3/64
- Selected Courses: Motion Control Systems, Signal and System, Automatic Control Theory, Optimization Theory, Probability and Mathematical Statistics

Research

Project (Ongoing): Programming of a complete static visual SLAM system • 06/2021

- Completed the code for distortion removal, initialization, and front-end optimization, working on the code for back-end optimization

Project: Monocular depth prediction and semantic segmentation based on attention mechanism • 01/2021 to present
- Most existing methods fail to fully leverage the semantic labels. This project proposed a supervised attention module, injecting context prior into the network.
- Designed feature sharing modules to fully leverage and merge different levels of feature maps.
- Submitted one **journal paper**

Project: Motion simulation design for cross-plane autonomous transition of adsorption hexapod climbing robot • 09/2020
- Designed the SS-shaped function that enabled the robot to lift and lower its feet vertically, avoiding abrasion of the suckers
- Equipped the robot with Lidar for detecting the distance between the robot and the slope, allowing the robot to lift and lower its feet at an appropriate distance
- Published one **conference paper** and Awarded **the first prize (Nationwide)** of the 2nd China Postgraduate Robot Innovation and Design Competition

Graduation Project: Design and Research on Lidar-based Navigation System of Autonomous Cleaning Vehicle • 01/2019 - 06/2019
- Implemented lidar SLAM and navigation based on the lidar equipped in autonomous cleaning vehicle with Ackermann steering structure
  a) Established the motion model of the Ackermann vehicle
  b) Set up the model and scenario of simulation for the vehicle using Gazebo
  c) Conducted contrast verification of gmapping SLAM, Hector SLAM, and Cartographer algorithm based on the model and scenario of simulation
  d) Planned the path for the simulated model combining the Dijistera global path planning algorithm and the TEB local path planning algorithm
  e) Verified the system in real-world scenarios
- Awarded **Excellent Graduation Design** for General Universities of Beijing

Project: Three-Dimensional Space Combination Maneuvering Unit for Parking • 2018
- Design a parking device requiring smaller area where more cars could be picked up or parked at one time
- Exploit embedded system to rotate each face of the parking unit and stop when detecting the changes of signal generated by hall sensor
- Awarded **First Prize in Beijing** of the 9th Mechanical Innovation and Design Competition for Colleges in the Capital Zone
- Obtained **P.R.C patent** for the parking unit

Publications	<u>Journal Article</u>: **Tianxiao Gao**, Wu Wei, Zhun Fan, Shane Xie, Xinmei Wang, Qiuda Yu. CI-Net: Contextual Information for Joint Semantic Segmentation and Depth Estimation. IEEE Transactions on Circuits and Systems for Video Technology. (under review, http://arxiv.org/abs/2107.13800)
	<u>Conference Article</u>: Zhongbin Cai , Yong Gao, Wu Wei , **Tianxiao Gao**, Zhijian Xie. Model design and gait planning of hexapod climbing robot. 2020 3rd International Symposium on Power Electronics and Control Engineering (***ISPECE 2020***)
	<u>P.R.C. Patent</u>: Three-Dimensional Space Combination Maneuvering Unit for Parking
	<u>Software Authorship</u>: Three-Dimensional Dense Point Cloud Map Construction System based on the Deep Camera
Research Interests	**General Areas:** Computer Vision and Deep Learning **Specific Areas:** Dynamic SLAM, Semantic SLAM **Key Words:** Semantic Segmentation, Depth Estimation, Visual Odometry, Loop Closure Detection, Convolutional Neural Network, Data Association
Professional Experience	**VK Robot Co Ltd.**, Guangzhou, China *Research & Development Engineer* • 07/2019 - 09/2019 & 06/2020 - 12/2020 • Designed two sorting and capturing algorithms for robotic arms based on color recognition and Aruco code recognition; Established the simulation model of the robotic arm on Gazebo and displayed the arm's real-time motion trajectory on rviz • Assisted in the organization of 2020 BRICS Skills Development and Technology Innovation Competition which attracted 17 teams nationwide and offered training in the system building and development of edge end to participants
Technical Skills	**Programming Languages:** C, C++, Python **Machine Learning Techniques:** PyTorch, TensorFlow **Development Platforms:** Robot Operating System (ROS), Ubuntu **Hardware Platforms**: STM32,NVIDIA Nano, TX2,XAVIER NX, Ordroid XU4 **Miscellaneous:** OpenCV, Eigen, G20, MATLAB, PointCloud, AutoCAD
Honors/ Awards	***Academic*** ✓ **National Merit Scholarship** • 10/2017 & 10/2016 ✓ SCUT Excellent Student Scholarship • 2019 ✓ BJFU 1st Class Scholarship for Excellent Student • 10/2017 & 10/2016 ✓ **Excellent Graduate of Beijing** • 2019 ✓ **Merit Student of Beijing** • 2018 ✓ BJFU Merit Student • 10/2017 & 10/2016 ✓ Excellent Award (Nationwide) and Second Prize in Beijing of the 11th iCAN International Contest of Innovation ✓ **First Prize (Nationwide)** of the 2nd China Postgraduate Robot Innovation and Design Competition • 2020 ✓ **First Prize** in Beijing of the 9th Mechanical Innovation and Design Competition for Colleges in the Capital Zone • 2018 ✓ **First Prize** of the National College Students Physics Competition • 2016 ✓ **Second Prize** of the Mathematics Competition for College Students in Beijing (Non-Math Major Division) • 2016 ***Non-academic*** ✓ Excellent Individual for Social Practice in Beijing • 2017 ✓ BJFU Excellent Social Practice Team • 2017 ✓ Excellent Advisor Assistant of the School of Technology, BJFU • 2017
Activities	*Vice Secretary* of the Electrical Engineering and Automation cohort, the School of Technology, BJFU • 2018 – 2019 *Vice Editorial Director* of the Student Union, the School of Technology, BJFU • 2016 – 2017 *Academic Commissary* of the EE 15-2 Administrative Class, BJFU • 2016 - 2019