BANGGUO YU

17923 Jingshi Road ◇ China, Jinan

(+86)17854253735 ◇ yubangguosdu@gmail.com ◇ http://yubangguo.com

EDUCATION

ShanDong University *2018.9 - Now*

M.S. in Control Engineering

ShanDong University of Science and Technology *2014.9 - 2018.6*

B.S. in Automation

Overall GPA: 86.8/100 (Top 10 out of 180 students in Comprehensive Performanc)

RESERCH INTERESTS

Robitics, Control, SLAM, Reinforcement learning

EXPERIENCE

Target-driven Navigation 03/2020 - now

Visual and Learning-based developing *Jinan, China*

- The platform of **Habitat** is used to achieve the target-driven visual navigation, and I focus on the task of ObjectNav using the semantic 3D scene graph in multi-room scene.
- The prior knowledge of scene is represented by 3D scene graph, and is encoded to feature by the relational graph convolution network.
- The visual and prior features are concatenated to the deep reinforcement learning model, and finally we can achieve the semantic navigation such as "go to the fridge".

3D Structured Semantic Scene Graph 08/2019 - 01/2020

DMAI, Inc. Reserch Intern *Guangzhou, China*

- A bottomup construction framework is designed for structured 3D scene graph generation, which efficiently describes the objects, relations and attributes of the 3D indoor environment with structured representation.
- The parse graph is calculated by the capture of semantic information and inference from scene priors.
- An improved probabilistic grammar model is used to represent the scene priors.
- The proposed framework significantly outperforms existing methods in terms of accuracy, and a demonstration is provided to verify the applicability in applying to high-level human-robot interaction tasks.

The Design of Conrol board 05/2019 - 08/2019

Embedded Engineer *Jinan, China*

- Design embedded control board circuit and shell
- Communication with server by CAN to control more than ten borads simultaneously
- Control strong electricity (220V AC) using weak current (5V DC)

Cloud-based Open loop SLAM 09/2018 - 04/2019

SLAM Algorithm Engineer *Jinan, China*

- Based on Cartographer, we focus on how to build map in gallery with sparse features using 2D laser.
- Apriltag is used as the position-known landmark to build the constraint and add it to global optimization.
- The accumulated error is adjusted by the extra constraint in sparse feature gallery and the failure of building map is avoided.
- Websocket is used to achieve the cloud-based mapping, which the sensor data is captured by the mobile robot and calculation is run in the cloud server.

Competition Robot 10/2017 - 06/2018
Embedded System Engineer *Qingdao, China*

- Construct and lead the team of robots in our college to finish the competition task that two robots should be designed to transmit the ball with a belt and throw the ball by the belt to target.
- Design the omnidirectional encoder wheel, and fuse IMU, ultrasonic sensor and laser to locate in the competition environment. More than one motors and pneumatic are used to transmit the ball between robots.
- The national first prize is got in Chinese University Robot Competition (ROBOCON), which is the best-known robotics contest in China, so I can exempt from Admission Exam to Shandong University.

PUBLICATIONS

A Bottom-up Framework for Construction of Structured Semantic 3D Scene Graph (Detail)
Bangguo Yu, Chongyu Chen, Fengyu Zhou, Fang Wan, Wenmi Zhuang, and Yang Zhao
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020 (**Submitted**)

AWARDS

2018 and 2019	2nd Prize	Shandong University Scholarship
2019.08	2nd Prize	The 14th China Graduate Electronics Design Contest
2018.06	1st Prize	The 17th China University Robot Competition (ROBOCON)
2018.06	1st Place	The 5th and 6th Shandong Provincial Robot Competition
2017.08	2nd Prize	National Undergraduate Electronocs Design Contest
2017.06	2nd Prize	Shandong Provincial Challenge Cup Technological Innovation Competition
2016.10	1st Place	The 5th Shandong Provincial University Robot Competition
2016.10	1st Place	The 2th Shandong SCM Application Design Competition
2016.08	2nd Prize	National Undergraduate Smart Car Contest

TECHNICAL SKILLS

Computer Languages	C/C++, python, Matlab, LaTeX
Robotics	ROS, PID Control, SLAM, Navigation, Reinforcement Learning, PyTorch
Embedden System	STM32, K60, CAN, UART, IIC, SPI
Design	Altium Designer for Circuit Board, SolidWorks for Machinery