Runyi Yang (杨润一)

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EDUCATION

Beijing Institute of Technology (BIT), Beijing, China **Sep 2019-Jul 2023**

Bachelor of Engineering in Automation (Exp. Jul 2023), GPA: 3.8/4.0, Score: 90.1/100

Awards: Outstanding Student Award, CASC Scholarship, Academic Excellence Scholarship × 5

Relevant Coursework: Mathematical Analysis(96), Linear Algebra(92), Probability and Statistics(93), Data Structure and Algorithm(93), C++ Programming(100), Intelligent Computing Systems(90), Reinforcement learning(95)

RESEARCH EXPERIENCE

Institute for AI Industry Research, Tsinghua University **Beijing, China**

Research Intern (DISCOVER Lab), Advised by Prof. Zhou Guyue *April 2022-Present*

◦ **City-scale Incrementally Neural Mapping**

- Construct a neural network frame to represent a road map implicitly;
- Analyze existing Signed Distance Function representation methods and make improvements by using Fourier features and learnable Fourier features.

◦ **Multi-scene Camera Re-localization**

- Apply manifold gradient to optimize the regression of camera re-localization in multi-scene;
- Design reprojection loss function and optimal method for camera re-localization task;
- Use multi-query to optimize the pose regression model.

Dynamics and Advanced Control Laboratory, Beijing Institute of Technology **Beijing, China**

Research Intern (Robotics Group), Advised by Prof. Zeng Xiangyuan *Jun 2021- May 2022*

◦ **Design and Construction of Ground Microgravity Platform**

- Establish a mathematical model of the microgravity platform, perform dynamic analysis of the microgravity system, and perform dynamic model analysis of the jumping, rolling, attitude adjustments and other actions of Cubic Robot;
- Design experiments to verify the motion mode of the Cubic Robot in the microgravity environment.

◦ **Improve Controller of the Cubic Robot (Cubli)**

- Design sensing system to collect real-time data of Cubic Robot in collaboration with the microgravity platform experiment;
- Improve the control system, structural design and braking module of the Cubic Robot for better dynamic characteristics.

School of Automation, Beijing Institute of Technology **Beijing, China**

Research Intern (Machine Learning Group), Advised by Prof. You Yuyang. *Nov 2019-Sep 2021*

◦ **A Non-destructive BCI Rehabilitation System based on Deep Learning**

- Preprocess of EEG signal data, use motor imagery to assist feature extraction and classification of EEG signals corresponding to different actions;
- Build a neural network model, use LSTM model to learn eigenvalues of EEG signals corresponding to different actions, then output values of different actions;

- Research on EMG signals of dominant muscles of different actions, and use DDS structure to design the waveform generating circuit to generate different EMG signals.

◦ **Automatic Sleep Diagnosis System based on Machine Learning**

- Monitor sleep by using BCI, collect sleep EEG signals, preprocess signal data and feature extraction.
- Use DeepSleepNet deep learning model, and classify sleep quality through KNN algorithm.

PUBLICATIONS

Shi Yongliang*, **Yang Runyi***, Li Pengfei, Wu Zirui, Feng Yixiao, Zhao Hao, Zhou Guyue†. City-scale Incremental Neural Mapping with Three-layer Sampling and Panoptic Representation. IEEE Robotics and Automation Letter. (In submission)

Jiang Bowen, Muhammad Talha Hussain, Jiang Jianxun, **Yang Runyi**, Zeng Xiangyuan†. Attitude Control Experiments of Cubic Rover on Low-Gravity Testbed. Transactions of Nanjing University of Aeronautics and Astronautics.

HONORS & PRIZES

◦ Honorable Mention, Mathematical Contest In Modeling, Comap — May 2022
◦ Third Prize, 13th National Mathematical Competition for College Students — Dec 2021
◦ Third Prize,12th International Humanoid Robot Olympiad — Oct 2021
◦ First Prize, BIT Balance Car Competition — Jun 2021
◦ Second Prize, 17th "Challenge Cup" National College Students' Extracurricular Academic Science and Technology Competition — May 2021
◦ Second Prize, BIT Electronic Design Competition — Apr 2021
◦ Third Prize in Beijing, Physics Regional Competition for College Students — Dec 2020
◦ Best Design Award & Excellence Award, 6th Smart Car Competition — Nov 2020
◦ Second Prize in Beijing, National Mathematical Contest in Modelling for College Students — Oct 2020
◦ Second Prize, College Students' Physics Academic Competition of Beijing — Aug 2020

ACTIVITIES & STUDENT ORGANIZATIONS

◦ *Founder, President*, BIT Swimming Club — Dec 2019-Jun 2022
◦ *Captain*, BIT Swimming Team — Mar 2021-Jun 2022
  - 8th place in the individual event, 3rd place in the team event of the University Swimming Games in Beijing.
◦ *Organizer,* First Swimming Match of BIT vs. Beihang University — June 2021
◦ *Organizer*, Second Swimming Games of BIT — Nov 2020
◦ *Class President* — Sep 2020-Present

SKILLS and LANGUAGE

Programming: C & C++, Python, MATLAB, Web(PHP+JavaScript+html5)
Software: Protues, Multisim, Simulink(MATLAB), AutoCAD, Altium Designer
IELTS: 6.5(6.0), CET-6: 557/710