

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, arxiv: 2209.14072)

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.

**Equal contribution, †Corresponding author*

HONORS & PRIZES

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| ◦ Honorable Mention, Mathematical Contest In Modeling, Comap | May 2022 |
| ◦ Third Prize, 13 th National Mathematical Competition for College Students | Dec 2021 |
| ◦ Third Prize, 12 th International Humanoid Robot Olympiad | Oct 2021 |
| ◦ First Prize, BIT Balance Car Competition | Jun 2021 |
| ◦ Second Prize, 17 th "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, 6 th 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

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|---|-------------------|
| ◦ <i>Founder, President</i> , BIT Swimming Club | Dec 2019-Jun 2022 |
| ◦ <i>Captain</i> , BIT Swimming Team | Mar 2021-Jun 2022 |
| <ul style="list-style-type: none"> • 8th place in the individual event, 3rd place in the team event of the University Swimming Games in Beijing. | |
| ◦ <i>Organizer</i> , First Swimming Match of BIT vs. Beihang University | June 2021 |
| ◦ <i>Organizer</i> , Second Swimming Games of BIT | Nov 2020 |
| ◦ <i>Class President</i> | Sep 2020-Present |

SKILLS and LANGUAGE

Programming: C & C++, Python, MATLAB, Web(PHP+JavaScript+html5)

Software: Protues, Multisim, Simulink(MATLAB), AutoCAD, Altium Designer, MeshLab

IELTS: 7, CET-6: 557/710