Runyi Yang

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EDUCATION

Imperial College London, London, United Kingdom   **Sep 2023 - Sep 2024**
Master of Research (MRes) in AI and Machine Learning, Computing, advised by Dr. Tolga Birdal
Research Topic: Quantifying Camera Relocalization Uncertainty via Conformal Prediction

Beijing Institute of Technology (BIT), Beijing, China   **Sep 2019 - Jun 2023**
Bachelor of Engineering in Automation, GPA: 3.8/4.0, Score: 90.1/100, Rank: <10%
Awards: Outstanding Graduates of BIT, Outstanding Student Award, CASC Scholarship, Academic Excellence Scholarship × 7, Student Representation of School of Automation
Concentrated Fields: NeRFs; 3D Reconstruction; Implicit Representation; Scene Understanding

PUBLICATIONS

Runyi Yang, Zhou Jiang, Zhenxin Zhu, Baijun Ye, Yifei Zhang, Yuantao Chen, Hao Zhao: *SUNDAE: Spectrally Pruned Gaussian Fields with Neural Compensation*. (In submission)

Yongliang Shi*, **Runyi Yang***, Zirui Wu, Pengfei Li, Caiyun Liu, Hao Zhao, Guyue Zhou: *City-scale continual neural semantic mapping with three-layer sampling and panoptic representation.* Knowledge-based Systems.

Zirui Wu, Tianyu Liu, Liyi Luo, Zhide Zhong, Jianteng Chen, Hongmin Xiao, Chao Hou, Haozhe Lou, Yuantao Chen, **Runyi Yang**, Yuxin Huang, Xiaoyu Ye, Zike Yan, Yongliang Shi, Yiyi Liao, Hao Zhao: *MARS: An Instance-aware, Modular and Realistic Simulator for Autonomous Driving.* CAAI International Conference on Artificial Intelligence. (Best Paper Runner-up Award, Oral Presentation, 2/348)

Runyi Yang, Zirui Wu, Yongliang Shi, Xin Wu, Guyue Zhou, Yurong Chen, Hongbin Zha, Hao Zhao: *PMB: Compositional Attribute-object Understanding with Pronouns.* (In submission)

Zirui Wu, Yuantao Chen, **Runyi Yang**, Zhenxin Zhu, Chao Hou, Yongliang Shi, Hao Zhao, Guyue Zhou: *AsyncNeRF: Learning Large-scale Radiance Fields from Asynchronous RGB-D Sequences with Time-Pose Function.* (In submission, arxiv: 2211.07459)

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

*Equal contribution

EXPERIENCE

DISCOVER Lab, Institute for AI Industry Research, Tsinghua University   **Hybrid**
Computer Vision Researcher, Advised by Prof. Zhou Guyue and Prof. Zhao Hao.   *May 2022 - Present*

○ Research in **Neural Radiance Fields** and **3D reconstruction**. Improve the sampling methods of point clouds for the implicit representation. Integrate graph-based methods to NeRFs and 3D Gaussian Splatting. Achieved balanced performance of rendering effects like PSNR, storage and performance.

○ Research in **scene understanding (compositional zero-shot learning)**. Regularize the output of the text branch and modify the neural network architecture of the image branch. Achieve SOTA performance on 3 public datasets MIT-States, UT-Zappos and VAW-CZSL.

○ Research in **camera pose estimation** (corresponding to SLAM), use deep learning methods to generate a robust loop-closure module. Build a loop-closure system for Xiaomi Robots indoor use.

○ Research in large-scale city map reconstruction using **Signed Distance Fields**. Achieved balanced performance on storage and geometric shape.

○ Produced 5 research papers, and 2 were accepted.

SOTA Tech Shanghai co., Ltd. **Hybrid**
Co-Founder (CTO, part-time) *Jun 2023 – Present*
- Develop a metaverse social platform by integrating MVS 3D reconstruction and Neural Radiance Fields. Built the whole pipeline and now mainly responsible for the algorithm and software maintenance.

Johnson Matthey Challenge, Data Study Group, The Alan Turing Institute **London, UK**
Facilitator *Nov 2023 - Dec 2023*
- Use LSTM, NARX and Transformer to forecast time series control variables in chemical processing scenarios. Achieved less than 0.1 RMSE in the prediction.
- Use conformal prediction methods to quantify the prediction region and uncertainty of the forecasting model.
- Facilitate a multidisciplinary team of 10 PhD researchers and data scientists.

Xverse (Top Metaverse Company in China) **Shenzhen, China**
Strategy Analyst *June 2023 – Aug 2023*
- Analysis of cutting-edge academic research and technological methods and tools, including NeRFs, 3D Reconstruction and LLMs.
- Focusing on applications in the intelligent city, intelligent agriculture, digital culture heritage, and virtual cultural tourism.

Dynamics and Advanced Control Laboratory, Beijing Institute of Technology **Beijing, China**
Research Intern (Robotics Group), Advised by Prof. Zeng Xiangyuan *Jun 2021 - May 2022*
- Build a microgravity platform for robotic physical simulation and produced 1 research paper.
Research Intern (Machine Learning Group), Advised by Prof. You Yuyang. *Nov 2019 - Sep 2021*
- A Non-destructive BCI Rehabilitation System and EEG Signal classification.

HONORS & PRIZES

- CICAI 2023 Best Paper Runner-up Award.	May 2023
- 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, Electronic Design Competition	Apr 2021
- 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

SKILLS and LANGUAGE

- Programming: **Python (PyTorch)**, **C & C++**, **MATLAB**, Web (PHP+JavaScript+html5), Kubeflow, Linux
- Software: Proteus, Multisim, Simulink (MATLAB), AutoCAD, Altium Designer, MeshLab
- IELTS: 7.0 (Listening 7.5, Reading 8.0, Writing 7.0, Speaking 6.0), CET-6: 557/710

EXTRACURRICULAR ACTIVITIES

- *Founder, President*, BIT Swimming Club	Dec 2019 - Jun 2022
- *Captain*, BIT Swimming Team	Mar 2021 - Jun 2022
- *Organizer,* First Swimming Match of BIT vs. Beihang University	Jun 2021
- *Organizer*, Second Swimming Games of BIT	Nov 2020