Runyi Yang
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EDUCATION

INSAIT, Sofia, Bulgaria **Jan 2025 - Present**
PhD in Computer Vision and Robotics, advised by Dr. Danda Paudel and Prof. Luc Van Gool
Research Topic: 3D Scene Understanding & Generation

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: 5%
Awards: Outstanding Graduates of BIT, Outstanding Student Award, Academic Excellence Scholarship × 8, Student Representative of School of Automation
Concentrated Fields: NeRFs; Gaussian Splatting; Scene Understanding; Unified Model for 3D generation and understanding

PUBLICATIONS & Pre-Prints

Survey Paper: Multimodal Spatial Reasoning in the Large Model Era: A Survey and Benchmarks. (Participation, *arxiv* 2510.25760)

Yue Li, Qi Ma, **Runyi Yang**, Mengjiao Ma, Bin Ren, Nikola Popovic, Nicu Sebe, Theo Gevers, Luc Van Gool, Danda Pani Paudel, Martin R. Oswald. Chorus: A Multi-Teacher Pretraining Framework for Holistic 3D Gaussian Scene Encoding. (In submission)

Runyi Yang*, Ren Bin*, Qi Ma, Xu Zheng, Mengyuan Liu, Danda Pani Paudel, Luc Van Gool, Rita Cucchiara, Nicu Sebe, Rethinking Expressivity and Degradation-Awareness in Attention for All-in-One Blind Image Restoration. (In submission)

Deheng Zhang, Yuqian Fu, **Runyi Yang**, Yang Miao, Tianwen Qian, Xu Zheng, Guolei Sun, Ajad Chhatkuli, Xuanjing Huang, Yu-Gang Jiang, Luc Van Gool, Danda Pani Paudel, EgoNight: Towards Egocentric Vision Understanding at Night with a Challenging Benchmark. (In submission, *arxiv 2510.06218*)

Mengjiao Ma, Qi Ma, Yue Li, Jiahuan Cheng, **Runyi Yang**, Bin Ren, Nikola Popovic, Mingqiang Wei, Nicu Sebe, Luc Van Gool, Theo Gevers, Martin R. Oswald, Danda Pani Paudel, SceneSplat++: A Large Dataset and Comprehensive Benchmark for Language Gaussian Splatting. (NeurIPS 2025, *arxiv 2506.08710*)

Yue Li, Qi Ma, **Runyi Yang**, Huapeng Li, Mengjiao Ma, Bin Ren, Nikola Popovic, Nicu Sebe, Ender Konukoglu, Theo Gevers, Luc Van Gool, Martin R. Oswald, Danda Pani Paudel, SceneSplat: Gaussian Splatting-based Scene Understanding with Vision-Language Pretraining. (ICCV 2025 Oral, *arxiv 2503.18052*)

Qi Ma, **Runyi Yang**, Bin Ren, Ender Konukoglu, Luc Van Gool, Danda Pani Paudel, CityLoc: 6 DoF Localization of Text Descriptions in Large-Scale Scenes with Gaussian Representation. (In submission, *arxiv 2501.08982*)

Runyi Yang, Zhou Jiang, Zhenxin Zhu, Baijun Ye, Yifei Zhang, Yuantao Chen, Hao Zhao. *SUNDAE: Spectrally Pruned Gaussian Fields with Neural Compensation*. (In submission, *arxiv 2405.00676*)

Yuhang Zheng, Xiangyu Chen, Yupeng Zheng, Songen Gu, **Runyi Yang**, Bu Jin, Pengfei Li, Chengliang Zhong, Zengmao Wang, Lina Liu, Chao Yang, Dawei Wang, Zhen Chen, Xiaoxiao Long, Meiqing Wang. *GaussianGrasper: 3D Language Gaussian Splatting for Robotic Grasping.* (IEEE RA-L*, arxiv 2403.09637*)

Runyi Yang*, Yongliang Shi*, 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)

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.* (WACV 2024, arxiv: 2211.07459)

**Equal contribution*

EXPERIENCE

Pixomondo Innovation Lab, Sony **Hybrid**

Part-time Research Scientist *May 2024 – October 2024*

- Integrate Integrating advanced 3D reconstruction methods, e.g. NeRFs and 3D Gaussian Splatting to VFX.
- Enable language-embeded 3DGS and use it for object removal and inpainting.
- Accommodate the current tools to viser as a viewer.

DISCOVER Lab, Institute for AI Industry Research, Tsinghua University **Hybrid**

Computer Vision Researcher, Advised by Prof. Zhou Guyue and Prof. Zhao Hao. *May 2022 – April 2024*

- 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 **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.

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. https://doi.org/10.5281/zenodo.13847810
- 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.

HONORS & PRIZES

- CICAI 2023 Best Paper Runner-up Award. May 2023

SKILLS and LANGUAGE

- Programming: **Python (PyTorch)**, **C & C++**, **MATLAB**, Web (PHP+JavaScript+html5), CUDA C
- Software: Proteus, Multisim, Simulink (MATLAB), AutoCAD, Altium Designer
- 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 Shuke & Beta Tournament — Jun 2021
- *Organizer*, Second Swimming Games of BIT — Nov 2020