WEIHAO YU

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Education

•The Chinese University of Hong Kong *Aug. 2023 - present*

Ph.D. candidate at Department of Electronic Engineering Hong Kong SAR

– Supervisor: Prof. Yixuan Yuan
– Topics: 3D/4D healthcare, Multimodal Large Language Model, AIGC

•Shanghai Jiao Tong University *Sept. 2020 - Mar. 2023*

M.Eng, Department of Automation Shanghai, China

– Supervisor: Prof. Jie Yang and Prof. Yun Gu
– Topics: 3D healthcare

•Shanghai Jiao Tong University *Sept. 2016 - July 2020*

B.Eng., School of Electronic Information and Electrical Engineering Shanghai, China

– Major: Automation (Artificial Intelligence track)
– Research: Independent researcher under the supervision of Prof. Lisheng Wang

Research Interests

• I am dedicated to advancing 3D/4D healthcare, including human body regions such as chest, abdomen, and oral cavity, as well as data modalities like CT, X-ray, and point clouds.

Internships

•BAAI Vision *Mar. 2023 - Aug. 2023*

Topic: Human-in-the-loop autonomous driving dataset construction *Beijing, China*

•Tencent YouTu Lab *Jan. 2022 - May 2022*

Topics: Image retrieval *Shanghai, China*

•SenseTime *Jan. 2020 - May 2020*

Topics: AI for education *Shanghai, China*

Publications

•X^2-Gaussian: 4D Radiative Gaussian Splatting for Continuous-time Tomographic Reconstruction

Weihao Yu, Yuanhao Cai, Ruyi Zha, Zhiwen Fan, Chenxin Li, Yixuan Yuan.

International Conference on Computer Vision (ICCV 2025)

•GaussianReg: Rapid 2D/3D Registration for Emergency Surgery via Explicit 3D Modeling with Gaussian Primitives

Weihao Yu, Xiaoqing Guo, Xinyu Liu, Yifan Liu, Hao Zheng, Yawen Huang, Yixuan Yuan.

International Conference on Computer Vision (ICCV 2025)

•ToothMaker: Realistic Panoramic Dental Radiograph Generation via Disentangled Control

Weihao Yu, Xiaoqing Guo, Wuyang Li, Xinyu Liu, Hui Chen, Yixuan Yuan.

IEEE Transactions on Medical Imaging (TMI)

•TNN: Tree neural network for airway anatomical labeling

Weihao Yu, Hao Zheng, Yun Gu, Fangfang Xie, Jie Yang, Jiayuan Sun, Guang-Zhong Yang.

IEEE Transactions on Medical Imaging (TMI)

•GeoT: Geometry-guided Instance-dependent Transition Matrix for Semi-supervised Tooth Point Cloud Segmentation

Weihao Yu, Xiaoqing Guo, Chenxin Li, Yifan Liu, Yixuan Yuan.

Information Processing in Medical Imaging (IPMI 2025)

•AirwayFormer: Structure-Aware Boundary-Adaptive Transformers for Airway Anatomical Labeling

Weihao Yu, Hao Zheng, Yun Gu, Fangfang Xie, Jiayuan Sun, Jie Yang.

International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2023)

•Break: Bronchi reconstruction by geodesic transformation and skeleton embedding

Weihao Yu, Hao Zheng, Minghui Zhang, Hanxiao Zhang, Jiayuan Sun, Jie Yang.

IEEE International Symposium on Biomedical Imaging (ISBI 2022)

Projects

•3D/4D Spatial Intelligence Specifically Designed for CT *Sept. 2024*

Role: Conceptualization, Experimentation, and Implementation, and Writing

- Employing Gaussian splatting for the reconstruction of dynamic 3D CTs, enabling precise CT reconstruction and accurate respiratory cycle estimation without external device intervention.
- Explicitly leveraging 3D information for intraoperative registration of patient X-rays, achieving precision requirements for emergency surgery with only 5 minutes of training time.

•Dental Perception and Generation *Aug. 2023*

Role: Conceptualization, Experimentation, Implementation, and Writing

- Developed ToothMaker, an innovative approach that enables precise panoramic dental radiograph generation under the guidance of large language models.
- Designed GeoT for dental point cloud data, utilizing noise transition matrices to estimate label noise distribution, thereby achieving precise segmentation.

•3D Intelligent Analysis of Lungs *Nov. 2020*

Role: Conceptualization, Experimentation, Implementation, and Writing

- Addressed the entire pipeline from data acquisition, processing, and annotation to problem definition, exploration, and resolution, designing a tree neural network based on the unique structure of airway trees, accomplishing subsegmental-level airway tree classification for the first time.
- Combined transformers with graph-based approaches, leveraging airway tree priors to achieve data-driven airway tree classification.

Technical Skills

- **Programming Languages:** Python, MATLAB, C/C++
- **Libraries and Tools:** PyTorch, PyTorch Lightning, Accelerate, Transformers, DeepSpeed, et al.