

# Tianyu Luan

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**Address** Davis Hall, 301B  
Buffalo, NY 14228  
**Website** [tyluann.github.io](https://tyluann.github.io)

**Phone** +1 (716) 817-3791  
**Email** [tianyulu@buffalo.edu](mailto:tianyulu@buffalo.edu)  
**Google Scholar** [XNzPzTIAAAAJ](https://scholar.google.com/citations?user=XNzPzTIAAAAJ)

## Profile

Tianyu Luan is a 4th-year(final-year) Ph.D. candidate at the [State University of New York at Buffalo](#), Buffalo NY, United States, advised by [Prof. Junsong Yuan](#). He received a B.S. degree in Applied Physics at [University of Science and Technology of China](#), and M.Eng. degree in Electronical and Telecommunication Engineering at [Tsinghua University](#), China. His research interest lies in 3D reconstruction/generation. He serves as a reviewer/program committee member in CVPR, ICCV, ECCV, AAAI, IJCAI, ACM MM, etc.. He also serves as a reviewer for T-PAMI, T-CSVT, MVA, and T-MM.

## Education

- 2021-pres.** **State University of New York at Buffalo**, Buffalo, NY, United States  
Ph.D. candidate (4th-year), Computer Science.  
Research topic: 3D shape fidelity measurement, recovery, and creation.
- 2014-2017** **Tsinghua University**, Beijing, China  
M.Eng., Electronic Engineering.  
Research topic: Visual Light Communication.
- 2009-2013** **University of Science and Technology of China**, Hefei, China  
B.S., Applied Physics.

## Experiences

- Jun. 2024 -** **Pixocial**, Bellevue, WA, United States  
**Aug. 2024** *Research Intern. Worked with [Dr. Haoxiang Li](#).*  
3D human generation.
- Feb. 2024 -** **United Imaging Intelligence**, Burlington, MA, United States  
**May. 2024** *Research Intern. Worked with [Dr. Zhongpai Gao](#) and [Dr. Ziyang Wu](#).*  
3D human hand reconstruction.
- May. 2023 -** **United Imaging Intelligence**, Cambridge, MA, United States  
**Aug. 2023** *Research Intern. Worked with [Dr. Zhongpai Gao](#) and [Dr. Ziyang Wu](#).*  
3D human body reconstruction.
- May. 2022 -** **OPPO Research**, Palo Alto, CA, United States  
**Aug. 2022** *Research Intern. Worked with [Dr. Zhong Li](#) and [Dr. Yi Xu](#).*  
3D hand reconstruction & mesh detailed evaluation.

**Jul. 2019 -** Chinese Academy of Science, Shenzhen, Guangdong, China  
**Jun. 2021** Research Assistant. Worked with [Prof. Yali Wang](#) and [Prof. Yu Qiao](#).  
3D human body reconstruction & pose estimation.

**Jun. 2017 -** HUAWEI Technology Co. Ltd., Shenzhen, Guangdong, China  
**Apr. 2019** Multimedia Algorithm Engineer.  
3D human face/object reconstruction R&D.

## Selected Works

- **Human perception aligned 3D shape metric.**
  - A spectrum-based 3D metric used on mesh shape comparison.
  - Analytic design and much closer to human perception than previous metrics.
  - Part connection module when multiple parts are visible in one image.
  - The work has been published by CVPR'2024.
- **3D hand reconstruction with shape details.**
  - Reconstruction of high-fidelity hand mesh from monocular RGB inputs.
  - Using Mesh frequency decomposition to recover high-frequency details.
  - Generating high-fidelity hands in a coarse-to-fine manner.
  - The work has been published by CVPR'2023 and T-PAMI'2025.
- **Human body part reconstruction.**
  - A framework that independently reconstructs the mesh of each body part.
  - Input: monocular image with only a few body parts visible.
  - Part connection module when multiple parts are visible in one image.
  - The work has been published by ECCV'2024.
- **Personalized Federated Learning via Injection and Distillation.**
  - A federated learning framework that tackles client drift issues for medical image analysis applications.
  - We can deal with the most commonly occurring scenarios in medical federated learning, in which system and data heterogeneous happens at the same time.
  - We verify our experiments on different medical tasks, including image segmentation/classification and temporal signal classification.
  - The work is published in ICML'2024.
- **Pose calibrated 3D human mesh reconstruction.**
  - A kinematic-based light-weighted framework to calibrate human body mesh using human pose.
  - 2 framework designs to leverage mesh accuracy and computational costs
  - The pose estimator and body mesh generator are designed in a plug-in manner.
  - The work is published in AAAI'2021 Main Track.

## Selected Publications (Click [here](#) for full list)

- [1]. **Tianyu Luan, et al.** "Scalable High-Fidelity 3D Hand Shape Reconstruction via Graph-Image Frequency Mapping and Graph Frequency Decomposition." Accepted by *IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)*. 2025.
- [2]. **Tianyu Luan, et al.** "Spectrum AUC Difference (SAUCD): Human-aligned 3D Shape Evaluation." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. 2024. [[Paper](#)] [[Project](#)] [[Code](#)]
- [3]. **Tianyu Luan, et al.** "Divide and Fuse: Body Part Mesh Recovery from Partially Visible Human Images." Accepted by ECCV. 2024. [[Paper](#)]

- [4]. **Tianyu Luan**, *et al.* "High Fidelity 3D Hand Shape Reconstruction via Scalable Graph Frequency Decomposition." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. 2023. [[Paper](#)][[Code](#)]
- [5]. **Tianyu Luan**, *et al.* "PC-hmr: Pose calibration for 3d human mesh recovery from 2d images/videos." *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*. 2021. [[Paper](#)]
- [6]. Luyuan Xie, **Tianyu Luan**<sup>†</sup>, *et al.* "dFLMoE: Decentralized Federated Learning via Mixture of Experts for Medical Data Analysis." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025. [[Paper](#)]
- [7]. Luyuan Xie, Manqing Lin, **Tianyu Luan**<sup>†</sup>, *et al.* "MH-pFLID: Model Heterogeneous personalized Federated Learning via Injection and Distillation for Medical Data Analysis." *International Conference on Machine Learning (ICML)*, 2024. [[Paper](#)]

## Teaching

- 21 Fall, Teaching Assistant, Computer Vision and Image Processing (CSE 573), University at Buffalo.
- 22 Spring, Teaching Assistant, Computer Vision and Image Processing (CSE 573), University at Buffalo.
- 22 Spring, Guest Instructor, Computer Vision and Image Processing (CSE 573), University at Buffalo.
- 22 Fall, Teaching Assistant, Computer Vision and Image Processing (CSE 573), University at Buffalo.
- 24 Fall, Teaching Assistant, Computer Vision and Image Processing (CSE 573), University at Buffalo.
- 25 Spring, Teaching Assistant, Computer Vision and Image Processing (CSE 573), University at Buffalo.

## Services

- Conference Review: CVPR'23'24'25, ICCV'23, ECCV'24, ACM MM'24, AAAI'25.
- Journal Review: IEEE TPAMI, IEEE TCSVT, MVA.