Mingfang Zhang

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Education

The University of Tokyo **Japan**
Ph.D., supervised by Professor Yoichi Sato *2023.4–2026.3*
M.Sc., supervised by Professor Yoichi Sato *2021.4–2023.3*
Research direction: computer vision and multimodal human action understanding

Nanjing Univeristy **China**
B.Sc. in Computer Science, Elite Class *2016.9–2020.8*

Internship Experience

CyberAgent AI Lab, Tokyo **2024**
Inertial Navigation and Open-Vocabulary Action Recognition Using Point Clouds

- Proposed a novel paradigm for the inertial navigation task by exploiting the relationship between human motion patterns and indoor point cloud data.
- Addressed the open-vocabulary action recognition task by integrating IMU sensor signals with point cloud data at dynamically estimated human positions.

Shanghai AI Lab, Shanghai **2023**
EgoBridge: A Dataset for Bridging Asynchronous First- and Third-Person View of Activities

- Introduced a large-scale dataset in which individuals record egocentric videos with gaze as they execute tasks guided by exo demonstration videos and presented three featured benchmarks.
- Proposed a new benchmark, cross-view referenced skill assessment, aiming to rank the skill level of two ego videos with an exo video of expert demonstration as reference.
- Designed two approaches to effectively leverage exo demonstration video and gaze data to benefit the accuracy of egocentric skill assessment.

Microsoft Research Asia, Beijing **2022**
Structural Multiplane Image: Bridging Neural View Synthesis and 3D Reconstruction

- Presented the Structural MPI representation, consisting of geometrically-faithful RGBα image layers to the 3D scene, for both neural view synthesis and 3D reconstruction.
- Proposed a network to construct the Structural MPI from posed images, where planar and non-planar regions are uniformly handled with approximations for geometries and light filed.
- Ensured multi-view consistency of planes by introducing the global proxy embeddings encoding the full 3D scene, and they evolve with the ensembled supervision from all views.

PCL Laboratory, Shenzhen **2021**
GazeOnce: Real-Time Multi-Person Gaze Estimation

- Proposed the first one-stage 3D gaze estimation method, estimating multi-user gaze simultaneously in a single image, and designed a projection-based self-supervised strategy for better accuracy.
- The proposed method not only outperforms previous SOTA methods in running speed, but also achieves better accuracy in wild conditions.

- Provided a new gaze dataset, enabling one-stage gaze estimation training and evaluation. It was generated by a sophisticated swap-gaze procedure with head pose matching.

Publication

Masked Video and Body-worn IMU Autoencoder for Egocentric Action Recognition
Mingfang Zhang, *Yifei Huang, Ruicong Liu, Yoichi Sato*
The European Conference on Computer Vision (ECCV), 2024 [pdf]

EgoExoLearn: A Dataset for Bridging Asynchronous Ego- and Exo-centric View of Activities
Yifei Huang, Guo Chen*, Jilan Xu*,* ***Mingfang Zhang****, ..., Limin Wang, Yu Qiao (*co-first author)*
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2024 [pdf]

Single-to-Dual-View Adaptation for Egocentric 3D Hand Pose Estimation
Ruicong Liu, Takehiko Ohkawa, ***Mingfang Zhang****, Yoichi Sato*
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2024 [pdf]

Structural Multiplane Image: Bridging Neural View Synthesis and 3D Reconstruction
Mingfang Zhang, *Jinglu Wang, Xiao Li, Yifei Huang, Yoichi Sato, Yan Lu*
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2023 [pdf]

GazeOnce: Real-Time Multi-Person Gaze Estimation
Mingfang Zhang, *Yunfei Liu, Feng Lu*
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022 [pdf]

Optical Flow in the Dark
Mingfang Zhang, *Yinqiang Zheng, Feng Lu*
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2021 [pdf]

Optical Flow in the Dark
Yinqiang Zheng,* ***Mingfang Zhang****, Feng Lu (* co-first author)*
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020 [pdf]

Awards

- Honorable mention in essay competition at ICVSS 2024
- 1st place award of EgoTracks challenge in Ego4D at CVPR 2023
- "Stars of Tomorrow" award by Microsoft Research Asia, 2022
- Excellent Graduation Paper award by Nanjing University, 2020

Skills

Programming Languages/Tools: Python, PyTorch, Detectron2, Linux Shell, LaTeX