

Jian Wang

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SUMMARY OF MY RESEARCH WORKS

My work mainly aims at capturing human motion from head-mounted egocentric fisheye cameras, including learning human motion priors for robust and accurate human pose estimation. Furthermore, my recent works include (1) reconstructing the photo-realistic human body from an egocentric view with Gaussian Splatting; (2) human motion generation conditioned on multi-model information.

Research Interest Human Motion Capture, Diffusion Models, 3D Gaussian Splatting, Human Motion Generation.

EDUCATION

VIA CENTER (PARTNERSHIP WITH GOOGLE) 2022.11 - 2024.09

Researcher Supervisors: Zhe Cao, Thabo Beeler (from Google); Diogo Luvizon, Christian Theobalt (from MPI)

MAX PLANCK INSTITUTE FOR INFORMATICS 2020.04 - 2024.09

Ph.D. Student in Computer Vision and Computer Graphics Supervisor: Christian Theobalt

INSTITUTE OF SOFTWARE, CHINESE ACADEMY OF SCIENCES 2016.09 - 2019.07

Master's Degree of Science in Engineering Supervisor: Naijun Zhan

★ High Performance Scholarship in 2018 (Top 10%) GPA: 3.68/4.00, Rank: 11/105

PEKING UNIVERSITY 2012.09 - 2016.07

Bachelor Degree of Science in Chemistry GPA: 3.44/4.00, Rank: 40/154

★ Pioneer Scholarship in 2013 (Top 20%)

RESEARCH PAPERS

- [1] **Wang, J.**, Cao, Z., Luvizon, D., Liu, L., Sarkar, K., Tang, D., Beeler, T. and Theobalt, C., 2024. Egocentric Whole-Body Motion Capture with FisheyeViT and Diffusion-Based Motion Refinement. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. (**CVPR**).
- [2] Akada, H., **Wang, J.**, Golyanik, V. and Theobalt, C., 2024. 3D Human Pose Perception from Egocentric Stereo Videos. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. (**CVPR Highlight, top 3% in all submissions**).
- [3] Millerdurai, C., Akada, H., **Wang, J.**, Luvizon, D., Theobalt, C., and Golyanik, V., 2024. EventEgo3D: 3D Human Motion Capture from Egocentric Event Streams. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. (**CVPR**).
- [4] **Wang, J.**, Luvizon, D., Xu, W., Liu, L., Sarkar, K. and Theobalt, C., 2023. Scene-aware Egocentric 3D Human Pose Estimation. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. (**CVPR**).
- [5] Akada, H., **Wang, J.**, Shimada, S., Takahashi, M., Theobalt, C. and Golyanik, V., 2022, October. UnrealEgo: A new dataset for robust egocentric 3d human motion capture. In *European Conference on Computer Vision*. (**ECCV**).
- [6] **Wang, J.**, Liu, L., Xu, W., Sarkar, K., Luvizon, D. and Theobalt, C., 2022. Estimating egocentric 3d human pose in the wild with external weak supervision. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. (**CVPR**).
- [7] **Wang, J.**, Liu, L., Xu, W., Sarkar, K. and Theobalt, C., 2021. Estimating egocentric 3d human pose in global space. In *Proceedings of the IEEE/CVF International Conference on Computer Vision*. (**ICCV Oral Presentation, top 3% in all submissions**).

- [8] **Wang, J.**, Zhong, Y., Li, Y., Zhang, C. and Wei, Y., 2019. Re-identification supervised texture generation. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. (**CVPR**).
- [9] Chen, M., **Wang, J.**, An, J., Zhan, B., Kapur, D. and Zhan, N., 2019, August. NIL: learning nonlinear interpolants. In *International Conference on Automated Deduction*. (**CADE**)
- [10] **Wang, J.**, An, J., Chen, M., Zhan, N., Wang, L., Zhang, M. and Gan, T., 2020. From model to implementation: a network algorithm programming language. *Science China Information Sciences*, 63, pp.1-17.

EXPERIENCES

RESEARCH INTERN 2019.11 - 2020.04

Max Planck Institute for Informatics

Performed Research in ego-centric motion capture. Leverage the human motion prior for refining the human motion estimation and SLAM estimation simultaneously.

RESEARCH INTERN 2018.06 - 2018.11

Face++ (Megvii Technology Ltd.)

Performed Research in 3D human body reconstruction and new methods to generate human textures from a single image.

RESEARCH INTERN 2017.10 - 2018.02

Institute of Automation, Chinese Academy of Sciences

Employed reinforcement learning algorithms for micro- and macro-management in the StarCraft combat environment. Leverage the PPO algorithm for controlling different types of units in a hierarchical approach.

SOFTWARE ENGINEER INTERN 2016.12 - 2017.06

Baidu Online Network Technology (Beijing) Co., Ltd.

Developed the first version of the table OCR system with table line detection algorithm. This system serves thousands of consumers.

RECENT PROJECTS (NOT PUBLICLY AVAILABLE)

EGO-DRIVEN AVATAR

- Drive pre-scanned avatar with egocentric motion with Deep Dynamic Character;
- Enhance the re-rendering quality with 3D Gaussian Splatting;
- Further refine the 3D Gaussian parameters with ego-view observation.

EGOOMNIMOCAP: CAPTURING EGOCENTRIC MOTION FROM ARBITRARY SENSORS

- Enable arbitrary IMU sensor setup for egocentric motion capture with masked transformer;
- Motion description for enhancing motion capture performance and LLM for downstream tasks;

EVENTEGO3D: 3D HUMAN MOTION CAPTURE FROM EGOCENTRIC EVENT STREAMS

- Real-time egocentric motion capture from event cameras;
- Residual event propagation module for filtering out background events.

MISCELLANEOUS

Invited Talks Joint Ego4D & EPIC workshop @ ICCV2021, CVPR 2022, and CVPR 2023

Reviewer Experience CVPR and ECCV

Teaching Experience Computer Vision and Machine Learning for Computer Graphics in 2021, 2022, and 2023