

Zhigang Tu

Position: Professor (IEEE Senior Member)

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◆ Biography

Zhigang Tu (Senior Member, IEEE) received the Ph.D. degree from Wuhan University, China, 2013, and the Ph.D. degree from Utrecht University, Netherlands, 2015. From 2015 to 2016, he was a Post-doctor with Arizona State University, USA. From 2016 to 2018, he was a Research Fellow with Nanyang Technological University, Singapore.

He is currently a Professor with Wuhan University, and has co-/authored more than 100 papers in international SCI-indexed journals and conferences. His research interests include computer vision, image processing and video analytics, with focusing on human behavior (pose, action, activity) recognition, reconstruction and generation. He is the Senior Area Chair of ICME, Area Chair of AAAI, Associate Editor of the journals of CAAI Transactions on Intelligence Technology (IF=7.3), Journal of Visual Comm. and Image Rep. (IF=3.1), Visual Computer (IF=2.9). He received the Best Student Paper Award at the 4th Asian Conference on Artificial Intelligence Technology, and one of the three Best Reviewers Award for IEEE Transactions on Circuits and Systems for Video Technology (IEEE T-CSVT) in 2022.

Research Interests

Computer Vision: Human Action/Activity Recognition, Prediction and Generation, Human/Hand Pose Estimation, Motion Estimation/Generation

Artificial Intelligence: Deep learning, CNN, GCN, Transformer

◆ Education & Working

Aug. 2018 – Present, Professor

Wuhan University, China

Dec. 2016–Jul. 2018, Research Fellow

Nanyang Technological University, Singapore

Advisor: Prof. Junsong Yuan (IEEE Fellow)

Dec. 2015–Nov. 2016, Postdoctoral Scholar

Arizona State University, USA

Advisor: Prof. Baoxin Li

Sep. 2011–Nov. 2015, Ph.D.

Utrecht University, Netherlands

Supervisor: Prof. Remco Veltkamp

Sep. 2008–Aug. 2011, MS-PhD

Wuhan University, China.

◆ Selected Journal Publications (First/Corresponding Author)

1. **Zhigang Tu**, Zhisheng Huang, Yujin Chen, Di Kang, Linchao Bao, Bisheng Yang, Junsong Yuan. Consistent 3D Hand Reconstruction in Video via Self-Supervised Learning. **IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)**, 45(8): 9469-9485, 2023.
2. Jiaxu Zhang, **Zhigang Tu***, Junwu Weng, Junsong Yuan, Bo Du. A Modular Neural Motion Retargeting System Decoupling Skeleton and Shape Perception. **IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)**, 46(10): 6889-6904, 2024.
3. **Zhigang Tu**, Zhengbo Zhang, Jia Gong, Junsong Yuan, Bo Du. Informative Sample Selection Model for Skeleton-based Action Recognition with Limited Training Samples. **IEEE Transactions on Image Processing (TIP)**, vol.34, pp.7335-7346, 2025.
4. **Zhigang Tu**, Yuanzhong Liu, Yan Zhang, Qizi Mu, Junsong Yuan. DTCM: Joint Optimization of Dark Enhancement and Action Recognition in Videos. **IEEE Transactions on Image Processing (TIP)**, vol.32, pp.3507-3520, 2023.
5. **Zhigang Tu**, Xiangjian Liu, Xuan Xiao. A General Dynamic Knowledge Distillation Method for Visual Analytics. **IEEE Transactions on Image Processing (TIP)**, vol.31, pp.6517-6531, 2022.
6. **Zhigang Tu**, Hongyan Li*, Dejun Zhang, Justin Dauwels, Baoxin Li, Junsong Yuan. Action-Stage Emphasized Spatio-Temporal VLAD for Video Action Recognition. **IEEE Transactions on Image Processing (TIP)**, 28(6):2799-2812, 2019.
7. Yijie Yang, Jinlu Zhang, Jiaxu Zhang, Bo Du, **Zhigang Tu***. Expressive Keypoints for Skeleton-based Action Recognition via Progressive Skeleton Evolution. **IEEE Transactions on Image Processing (TIP)**, vol.34, pp.7585-7599, 2025.
8. Yuanzhong Liu, Junsong Yuan, **Zhigang Tu***. Motion-driven Visual Tempo Learning for Video-based Action Recognition. **IEEE Transactions on Image Processing (TIP)**, vol.31, pp.4104-4116, 2022.
9. Yujin Chen[#], **Zhigang Tu[#]**, Di Kang, Ruizhi Chen, Linchao Bao, Zhengyou Zhang, Junsong Yuan. Joint Hand-object 3D Reconstruction from a Single Image with Cross-branch Feature Fusion. **IEEE Trans. Image Processing (TIP)**, 30:4008-4021, 2021.
10. Long Tian, **Zhigang Tu***, Dejun Zhang, Jun Liu, Baoxin Li, Junsong Yuan. Unsupervised Learning of Optical Flow With CNN-based Non-Local Filtering. **IEEE Transactions on Image Processing (TIP)**, vol.29, pp.8429-8442, 2020.
11. **Zhigang Tu**, Zhengbo Zhang, Zitao Gao, Chunlun Zhou, Junsong Yuan, Bo Du. FADE: A Dataset for Detecting Falling Objects around Buildings in Video. **IEEE Transactions on Information Forensics and Security (TIFS)**, vol.20, pp.9746-9759, 2025.
12. Shihao Cheng, Jinlu Zhang, Yue Liu, Aoran Xiao, **Zhigang Tu***. OwlSight: A Robust Illumination Adaptation Framework for Dark Video Human Action Recognition. **IEEE Transactions on Circuits and Systems for Video Technology**, 2025.
13. Xiangyue Zhang, Yifan Jia, Jiaxu Zhang, Yijie Yang, **Zhigang Tu***. Robust 2D Skeleton Action Recognition via Decoupling and Distilling 3D Latent Features. **IEEE Transactions on Circuits and Systems for Video Technology**, 35(10): 10410-10422, 2025.
14. Zitao Gao, Bing Qu, Chunlun Zhou, Junsong Yuan, **Zhigang Tu***. EBPpersons: A Dataset for Person Detection at the Edges of Buildings. **IEEE Transactions on Multimedia**, 2026.

15. Tianqi Xiang, Xinghui Xia, Junsong Yuan, **Zhigang Tu***. Fre-STformer: A Frequency-based Spatio-Temporal Transformer for UAV Human Action Recognition. *IEEE Transactions on Multimedia*, 2026.
16. Songlian Li, Min Hu, Xiongwu Xiao, **Zhigang Tu***. Patch Similarity Self-Knowledge Distillation for Cross-view Geo-localization. *IEEE Transactions on Circuits and Systems for Video Technology*, 34(6): 5091-5103, 2024.
17. **Zhigang Tu**, Jiaxu Zhang, Hongyan Li, Yujin Chen, Junsong Yuan. Joint-bone Fusion Graph Convolutional Network for Semi-supervised Skeleton Action Recognition. *IEEE Transactions on Multimedia*, vol.25, pp.1819-1831, 2023.
18. Jiaxu Zhang, Yifan Jia, Wei Xie, **Zhigang Tu***. Zoom Transformer for Skeleton-based Group Activity Recognition. *IEEE Transactions on Circuits and Systems for Video Technology*, 32(12):8646-8659, 2022.
19. **Zhigang Tu***, W. Xie, J. Dauwels, B. Li, J. Yuan. Semantic Cues Enhanced Multi-modality Multi-Stream CNN for Action Recognition. *IEEE Transactions on Circuits and Systems for Video Technology*, 29(5): 1423-1437, 2019.
20. Songlian Li, **Zhigang Tu***, Yujin Chen. Multi-scale attention encoder for street-to-aerial image geo-localization. *CAAI Transactions on Intelligence Technology*, 8:166-176, 2023.
21. Jiaxu Zhang, Gaoxiang Ye, **Zhigang Tu***, Yongtao Qin, Qianqing Qin, Jinlu Zhang, Jun Liu. A Spatial Attentive and Temporal Dilated (SATD) GCN for Skeleton-Based Action Recognition. *CAAI Transactions on Intelligence Technology*, 7(1): 46-55, 2022.
22. **Zhigang Tu**, Hongyan Li, Wei Xie, Yuanzhong Liu, Shifu Zhang, Baoxin Li, Junsong Yuan. Optical Flow for Video Super-Resolution: A Survey. *Artificial Intelligence Review*, vol.55, pp.6505-6546, 2022.
23. Yunpeng Chang, **Zhigang Tu***, Bin Luo, Junsong Yuan. Video Anomaly Detection with Spatio-Temporal Dissociation. *Pattern Recognition*, vol.122, pp.108213:1-12, 2022.
24. Dejun Zhang*, Linchao He, **Zhigang Tu***, Shifu Zhang, Fei Han, Boxiong Yang. Learning Motion Representation for Real-Time Spatio-Temporal Action Localization. *Pattern Recognition*, vol.103, pp.107312, 2020.
25. **Zhigang Tu***, Wei Xie*, Dejun Zhang, Ronald Poppe, Remco Veltkamp, Baoxin Li, Junsong Yuan. A survey of variational and CNN-based optical flow techniques. *Signal Processing: Image Communication*, vol.72, pp.9-24, 2019.
26. **Zhigang Tu**, Wei Xie, Qianqing Qin*, Remco Veltkamp, Baoxin Li, Junsong Yuan. Multi-Stream CNN: Learning Representations Based on Human-Related Regions for Action Recognition. *Pattern Recognition*, vol.79, pp.32-43, 2018.
27. **Zhigang Tu***, Zuwei Guo, Wei Xie, Mengjia Yan, Remco Veltkamp, Baoxin Li, Junsong Yuan. Fusing disparate object signatures for salient object detection in video. *Pattern Recognition*, vol.72, pp.285-299, 2017.
28. **Zhigang Tu***, WeiXie, JunCao, Coertvan Gemeren, Ronald Poppe, Remco Veltkamp. Variational Method for Joint Optical Flow Estimation and Edge-aware Image Restoration. *Pattern Recognition*, vol.65, pp.11-25, 2017.
29. **Zhigang Tu***, R. Poppe, Remco Veltkamp. Weighted Local Intensity Fusion Method for Variational Optical Flow Estimation. *Pattern Recognition*, vol.50, pp.223-232, 2016.
30. Zhigang Tu, Nico. Aa, C. Gemeren, Remco Veltkamp. A combined post-filtering method to improve accuracy of variational optical flow estimation. *Pattern Recognition*, 47(5): 1926-1940, 2014.

◆ Selected Conference Publications (First/Corresponding Author)

1. Jiaxu Zhang, Xianfang Zeng, Gang Yu, **Zhigang Tu***, et al. MikuDance: Animating Character Art with Mixed Motion Dynamics. In Proc. **ICCV**, pp.19689-19699, 2025.
2. Xiangyue Zhang, Jianfang Li, Jiaxu Zhang, Ziqiang Dang, Jianqiang Ren, Liefeng Bo, **Zhigang Tu***. SemTalk: Holistic Co-speech Motion Generation with Frame-level Semantic Emphasis. In Proc. **ICCV**, pp. 13761-13771, 2025.
3. Zhisheng Huang, Yujin Chen, Di Kang, Jinlu Zhang, **Zhigang Tu***. PHRIT: Parametric Hand Representation with Implicit Template. In Proc. **ICCV**, pp.14974-14984, 2023.
4. Yujin Chen, **Zhigang Tu***, Liuhaio Ge, Dejun Zhang, Ruizhi Chen, Junsong Yuan. SO-HandNet: Self-Organizing Network for 3D Hand Pose Estimation with Semi-supervised Learning. In Proc. **ICCV**, pp.6961-6970, 2019.
5. Zhengbo Zhang, Yuxi Zhou, Duo Peng, Joo Hwee Lim, **Zhigang Tu***, De Wen Soh, Lin Geng Foo. Visual Prompting for One-shot Controllable Video Editing without Inversion. In Proc. **CVPR**, pp.7784-7794, 2025.
6. Jiaxu Zhang, Junwu Weng, Di Kang, Fang Zhao, Shaoli Huang, Xuefei Zhe, Linchao Bao, Ying Shan, Jue Wang, **Zhigang Tu***. Skinned Motion Retargeting with Residual Perception of Motion Semantics & Geometry. In Proc. **CVPR**, pp.13864-13872, 2023.
7. Jinlu Zhang, **Zhigang Tu***, Jianyu Yang, Yujin Chen, Junsong Yuan. MixSTE: Seq2seq Mixed Spatio-Temporal Encoder for 3D Human Pose Estimation in Video. In Proc. **CVPR**, pp.13232-13242, 2022.
8. Yujin Chen, **Zhigang Tu***, Di Kang, Linchao Bao, Ying Zhang, Xuefei Zhe, Ruizhi Chen, Junsong Yuan. Model-based 3D Hand Reconstruction via Self-Supervised Learning. In Proc. **CVPR**, pp.10451-10460, 2021.
9. Xiangyue Zhang, Jianfang Li, Jiaxu Zhang, Jianqiang Ren, Liefeng Bo, **Zhigang Tu***. EchoMask: Speech-Queried Attention-based Mask Modeling for Holistic Co-Speech Motion Generation. In Proc. **ACM Multimedia**, pp.10827-10836, 2025.
10. Jiaxu Zhang, Xin Chen, Gang Yu, **Zhigang Tu***. Generative Motion Stylization of Cross-structure Characters within Canonical Motion Space. In Proc. **ACM Multimedia**, pp.7018-7026, 2024.
11. Jinlu Zhang, Yujin Chen, **Zhigang Tu***. Uncertainty-Aware 3D Human Pose Estimation from Monocular Video. In Proc. **ACM Multimedia**, pp.5102-5113, 2022.
12. Jiaxu Zhang, Shaoli Huang, **Zhigang Tu***, Xin Chen, Xiaohang Zhan, Gang Yu, Ying Shan. TapMo: Shape-aware Motion Generation of Skeleton-free Characters. In Proc. International Conference on Learning Representations (**ICLR**), 2024.
13. Zhengbo Zhang, Chunlan Zhou, **Zhigang Tu***. Distilling Inter-Class Distance for Semantic Segmentation. In Proc. **IJCAI**, pp.1686-1692, 2022.
14. Yunpeng Chang, **Zhigang Tu***, Wei Xie, Junsong Yuan. Clustering-driven Deep Autoencoder for Video Anomaly Detection. In Proc. European Conference on Computer Vision (**ECCV**), pp.329-345, 2020.
15. **Zhigang Tu**, Yikang Li, Jun Cao, and Baoxin Li. MSR-CNN: Applying Motion Salient Region Based Descriptors for Action Recognition. In Proc. International Conference on Pattern Recognition (**ICPR**), pp. 3524–3529, 2016.

◆ Services

Associate Editor

CAAI Transactions on Intelligence Technology (IF=7.3)

Visual Computer (IF=2.9)

Journal of Visual Communication and Image Representation (IF=3.1)

SCI-Indexed Journal Special Issue Organizer

1. Organizer, Special Issue: Multi-Modality Human Activity Understanding, JVCIR
<https://www.journals.elsevier.com/journal-of-visual-communication-and-image-representation/call-for-papers/multi-modality-human-activity-understanding>

Conference Organizer

1. Organizer, Workshop: Multi-visual-Modality Human Activity Understanding (MMHAU), ACCV 2020, Kyoto, Japan
http://tuzhigang.cn/ACCV_Workshop.html
2. Organizer, Workshop: Multi-sensor for Action and Gesture Recognition, 5th Asian Conference on Pattern Recognition (ACPR) 2019, New Zealand.
<https://www.acpr2019.org/>

Conference Chairs

Senior Area Chair: ICME 2026, PRCV 2025, AAAI 2025

Area Chair: ICME 2025, AAAI 2024/2023

Website & Social Media Chairs: ICME 2024

Journal Reviewer

IEEE TPAMI/TIP/TMM/TCSVT/TNNLS/TCB/TII/TIFS/TGRS/TAI/TITS

International Journal of Computer Vision (IJCV)

Pattern Recognition/Artificial Intelligence/Artificial Intelligence Review/Neurocomputing

Conference Reviewer

CVPR/ICCV/ECCV/NeurIPS/ICLR/ICML/AAAI/ACM MM/IJCAI

◆ Awards

2022, Best Reviewers Award, IEEE Transactions on Circuits and Systems for Video Technology (IEEE TCSVT)

2021, Best Student Paper Award, 4th Asian Conference on Artificial Intelligence Technology

2021, 1st Runner-up, Fisheye Video-based Action Recognition, ICCV 2021 Competition

2021, 1st Runner-up, Skeleton-based Action Recognition, ICCV 2021 Competition