

Zhigang Tu

Professor

State Key Laboratory of Information Engineering in Surveying, Mapping and Remote sensing (LIESMARS), Wuhan University, China

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【 Bio & CV 】

Zhigang Tu started his Master Degree in image processing at the School of Electronic Information, Wuhan University, China, 2008. In 2015, he received the Ph.D. degree in Computer Science from Utrecht University, Netherlands. From 2015 to 2016, he was a postdoctoral researcher at Arizona State University, US. Then from 2016 to 2018, he was a research fellow at the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. He is currently a professor at the State Key Laboratory of Information Engineering in Surveying, Mapping and Remote sensing, Wuhan University. His research interests include computer vision, image processing, video analytics, and machine learning. Special for motion estimation, object segmentation, action recognition and localization, hand/human pose estimation, and anomaly detection. On those topics, he has co-/authored more than 50 articles on international SCI-indexed journals and conferences, e.g. Pattern Recognition (PR), IEEE Trans. Image Process. (TIP), IEEE Trans. Circuits and Sys. Video Tech. (T-CSVT), CVPR, ICCV, ECCV, etc. He is an Executive Guest Editor of the SCI-indexed journal Combinatorial Chemistry & High Throughput Screening (IF=1.195). He is the organizer of the ACCV2020 Workshop on MMHAU (Japan) and the ACPR2019 Workshop on MAGR (New Zealand). He serves as a reviewer for more than 10 SCI-indexed journals and conferences, e.g., Pattern Recognition, IEEE Trans. Image Process., IEEE TCSVT, CVPR, ICCV, etc. He serves as a Program Committee for AAAI-2021. He received the “Best Student Paper” Award in the 4th Asian Conference on Artificial Intelligence Technology.

【 Research Interests 】

Computer Vision: Motion Estimation, Object Detection & Segmentation, Human Action Analysis (Action Recognition/Localization/Prediction), Anomaly Detection.

Image Processing: Image Filter, Deblurring, Restoration, and Reconstruction

Mathematical Method: Variational Computation and Probabilistic Computation

Artificial Intelligence: Supervised/Semi-Supervised/Un-supervised Deep learning

【 Working and Education 】

Dec. 2016–July 2018, Research Fellow

School of Electrical, Electronic Engineering (EEE)

Nanyang Technological University, Singapore

Co-Advisor: Prof. Junsong Yuan

Dec. 2015–Nov. 2016, Postdoctoral Scholar

School of Computing, Informatics, Decision System Engineering

Arizona State University, USA

Co-Advisor: Prof. & Chair Baoxin Li

Sep. 2011–Nov. 2015, Ph.D.

Institute of Information and Computing Sciences,

Utrecht University, Netherlands.

Supervisor: Prof. Remco Veltkamp

Sep. 2008–Aug. 2011, MS-PhD

The State Key Laboratory of information Engineering in Surveying, Mapping and Remote Sensing

Wuhan University, China.

【Master/PhD Positions】

- We are looking for masters and PhD. The researchers, who have the background of Computer Science, Information, Computational mathematics, etc., are welcome.
- Major: Computer Vision, Pattern Recognition, Deep Learning
- Quality for PhD: as the first author or the corresponding author published articles in following journals or conferences: TPAMI/IJCV/TIP/PR/TCSVT, CVPR/ICCV/ECCV/NeurIPS, etc.

【Selected Publications】

1. Long Tian, **Zhigang Tu***, Dejun Zhang, Jun Liu, Baoxin Li, and Junsong Yuan. Unsupervised Learning of Optical Flow With CNN-based Non-Local Filtering. **IEEE Transactions on Image Processing (T-IP)**, vol.29, pp.8429–8442, 2020.
2. Yunpeng Chang, **Zhigang Tu***, Wei xie, Junsong Yuan. Clustering-driven Deep Autoencoder for Video Anomaly Detection. **European Conference on Computer Vision (ECCV)**, 2020.
3. Dejun Zhang*, Linchao He, **Zhigang Tu***, Shifu Zhang, Fei Han, and Boxiong Yang. Learning Motion Representation for Real-Time Spatio-Temporal Action Localization. **Pattern Recognition**, vol.103, pp.107312:1–10, 2020.
4. Yujing Chen, **Zhigang Tu***, Lihao Ge, Dejun Zhang, Ruizhi Chen, and Junsong Yuan. SO-HandNet: Self-Organizing Network for 3D Hand Pose Estimation with Semi-supervised Learning. In Proc. Int. Conf. Comp. Vision (**ICCV**), pp.6961–6970, **2019**.
5. **Zhigang Tu**, Hongyan Li*, Dejun Zhang, Justin Dauwels, Baoxin Li, and Junsong Yuan. Action-Stage Emphasized Spatio-Temporal VLAD for Video Action Recognition. **IEEE Transactions on Image Processing (T-IP)**, 28(6): 2799–2812, **2019**.
6. **Zhigang Tu***, Wei Xie*, Dejun Zhang, Ronald Poppe, Remco C. Veltkamp, Baoxin Li, and Junsong Yuan. A survey of variational and CNN-based optical flow techniques. **Signal Processing: Image Communication**, vol.72, pp.9–24, March **2019**.

7. **Zhigang Tu***, Wei Xie, Justin Dauwels, Baoxin Li, and Junsong Yuan. Semantic Cues Enhanced Multi-modality Multi-Stream CNN for Action Recognition. *IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)*, 29(5): 1423–1437, **2019**.
8. **Zhigang Tu**, Wei Xie, Qianqing Qin, Remco C. Veltkamp, Baoxin Li, and Junsong Yuan. Multi-Stream CNN: Learning Representations Based on Human-Related Regions for Action Recognition. *Pattern Recognition*, vol.79, pp.32–43, **2018**.
9. Shizheng Wang, Wenjuan Liao, **Zhigang Tu**, Yuanjin Zheng, and Junsong Yuan. Saliency Guided Depth Calibration for Perceptually Optimized Compressive Light Field 3D Display. In *Proc. Comput. Vis. Pattern Recogn. (CVPR)*, **2018**.
10. **Zhigang Tu**, Zuwei Guo, Wei Xie, Mengjia Yan, Remco Veltkamp, Baoxin Li, and Junsong Yuan. Fusing disparate object signatures for salient object detection in video. *Pattern Recognition*, vol.72, pp.285–299, 2017.
11. **Zhigang Tu**, Wei Xie, C. Gemeren, and Remco C. Veltkamp. Variational Method for Joint Optical Flow Estimation and Edge-aware Image Restoration. *Pattern Recognition*, vol.65, pp.11–25, 2017.
12. **Zhigang Tu**, Ronald Poppe, and Remco C. Veltkamp. Weighted Local Intensity Fusion Method for Variational Optical Flow Estimation. *Pattern Recognition*, vol.50, pp.223–232, 2016.
13. **Zhigang Tu**, Nico Aa, C. Gemeren, and Remco C. Veltkamp. A combined post-filtering method to improve accuracy of variational optical flow estimation. *Pattern Recognition*, vol.47, no.5, pp.1926–1940, 2014.
14. **Zhigang Tu**, Ronald Poppe, and Remco C. Veltkamp. Adaptive Guided Image Filter for Warping in Variational Optical Flow. *Signal Processing*, vol.127, pp.253–265, 2016.
15. **Zhigang Tu**, Yikang Li, Jun Cao, and Baoxin Li. MSR-CNN: Applying Motion Salient Region Based Descriptors for Action Recognition. In *Proc. Int. Conf. Pattern Recogn. (ICPR)*, pp. 3524–3529, 2016.
16. **Zhigang Tu**, Coert Van Gemeren, and Remco C. Veltkamp. Improved color patch similarity measure based weighted median filter. In *Proc. Asian Conf. Comput. Vis. (ACCV)*, vol.9007, pp.413–427, 2015.
17. **Zhigang Tu**, Ronald Poppe, and Remco C. Veltkamp. Estimating Accurate Optical Flow in the Presence of Motion Blur. *Journal of Electronic Imaging*, vol.24, no.5, 053018, **2015**.
18. Michael Hoy, **Zhigang Tu**, Dang Kang, and Justin Dauwels. Learning to Predict Pedestrian Intention via Variational Tracking Networks. *International Conference on Intelligent Transportation Systems (ITSC)*, 2018.
19. Kang Dang, Chunluan Zhou, **Zhigang Tu**, Justin Dauwels, and Junsong Yuan. Actor-Action Semantic Segmentation with Region Masks. In *Proc. The British Machine Vis. Conf. (BMVC)*, 2018.

【Services】

Guest Editor

Guest Editor of the SCI-indexed journal Combinatorial Chemistry & High Throughput Screening (IF=1.195)

Organizer & Chair

1. Organizer of the ACCV 2020 Workshop on Multi-visual-Modality Human Activity Understanding (MMHAU), Kyoto, Japan
http://tuzhigang.cn/ACCV_Workshop.html
2. Organizer of the 5th Asian Conference on Pattern Recognition (ACPR) 2019 Workshop on Multi-sensor for Action and Gesture Recognition, 26-29 November 2019, Auckland, New Zealand.
<https://www.acpr2019.org/>

Journal Reviewer

IEEE Transactions on Pattern Analysis and Machine Intelligence
IEEE Transactions on Image Processing
IEEE Transactions on Circuits and Systems for Video Technology
IEEE Transactions on Multimedia
IEEE Signal Processing Letters
Pattern Recognition - Elsevier
Artificial Intelligence - Elsevier
Signal Processing - Elsevier
Signal Processing: Image Communication - Elsevier
Image and Vision Computing - Elsevier
Neurocomputing - Elsevier
Pattern Recognition Letter - Elsevier
Artificial Intelligence Review - Springer
The Visual Computer Journal - Springer

Conference Reviewer

IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)
IEEE/CVF International Conference on Computer Vision (ICCV)
The AAAI Conference on Artificial Intelligence (AAAI)
ACM Multimedia
IEEE International Conference on Image Processing (ICIP), 2017/2018/2019
IEEE International Conference on Pattern Recognition (ICPR) 2018
IEEE International Conference on Multimedia and Expo (ICME), 2018/2019