Jiahuan Zhou

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Current

Research Assistant Professor, Dept.of ECE *Dec, 2020 - Now*
Northwestern University, Evanston, IL

Education

Postdoctoral Fellow, Dept.of ECE *Feb, 2019 - Dec, 2020*
Northwestern University, Evanston, IL

Ph.D. in Computer Science, Dept.of EECS *Dec, 2018*
Northwestern University, Evanston, IL
Advisor: Professor Ying Wu
Dissertation: *Learning Visual Matching From Small-Size Samples*

B.S in Electrical Engineering, Dept.of Automation *Jul, 2013*
Rank:13/150+
Tsinghua University, Beijing, China

Research Interests

- Computer Vision and Deep Learning
- Machine Learning and Pattern Recognition
- Image&Video Processing, Analysis, and Understanding
- Visual Instance Retrieval and Identification
- Visual Object Detection and Classification

Experience

Microsoft Research *Redmond, WS*
Research Intern. Mentor: Dr. Gang Hua *June, 2018 – Aug, 2018*

- Led an objection detection project.
- Proposed a novel guided conscious inference network for CNN-based object detection.

Computational Vision Lab, Northwestern University *Evanston, IL*
Research Assistant. *Mar, 2017 – Dec, 2018*
Advisor: Professor Ying Wu *June, 2014 – Feb, 2017*
Sep, 2013 – Feb, 2014

- Led several research projects funded by National Science Foundation (NSF), Army Research Office (ARO), Department of Defense (DoD) and so on.

Teaching Assistant. *Mar, 2017 – June, 2017*
Feb, 2014 – June, 2014

Laboratory of PRIP in Dept.of Automation, Tsinghua University *Beijing, China*
Graduate Research Assistant. Advisor: Professor Jianjiang Feng *Sep, 2012 – June, 2013*

- Proposed a novel algorithm for automatic vehicle detection under both the static and dynamic cameras.
- Researched the spectral clustering problem and proposed a novel spectral clustering method.

Kingdee International Software Group Company Limited *Beijing, China*
Intern Software Engineer. Advisor: Dr.Dong Liu *June, 2012 – Sep, 2012*

- Researched the methods of optimizing the efficiency of the PaaS (Platform-as-a-Service).
- Developed a web application based on the CloudFoundry.

Laboratory of CIMS in Dept.of Automation, Tsinghua University *Beijing, China*
Student Research Assistant. Advisor: Professor Heming Zhang *Sep, 2011 – June, 2012*

- Researched and explored the track irregularity problem.
- Designed and performed simulated experiments to test the influence of different parameters to track irregularity.

Research Experience

Department of Defense (DoD), Navy SBIR/STTR *Evanston, IL*
Leading the project *Aug, 2017 – Nov, 2021*

- Project Phase-I Subject: *Integrated Learning-based and Regularization-based Super-Resolution for Extreme MWIR Image Enhancement*
  (`https://www.sbir.gov/sbirsearch/detail/1489629`)
- Project Phase-II Subject: *Improved Infrared Imaging with Variable Resolution Achieved via Post-Processing*
- Researched the unique properties of mid-wave infrared (MWIR) images and the issues of existing natural image-based super-resolution methods.
- Designed a novel super-resolution method for MWIR images by integrating a deep-learning edge enhanced model with a proposed explicit soft-edge regularization prior to generate sharp edges in the results.

Army Research Office (ARO) *Evanston, IL*
Leading the project *Sep, 2015 – June, 2016*

- Project Subject: *Handling Adverse Visual Conditions for Target Tracking and Recognition*
- Explored the issues of existing visual target tracking models under the extreme adverse conditions, e.g., rainy, hazy, snowy.
- Researched the unique properties of different adverse weather conditions.
- Designed a learning-based tracker for robust visual target tracking under adverse conditions.

Samsung GRO Project *Evanston, IL*
Leading the project *Sep, 2013 – Dec, 2014*

- *Project Subject: Single Frame Super Resolution for Ultra High Definition Display*
- Researched the model-based and learning-based single image super-resolution methods.
- Designed a novel single image super-resolution algorithm by integrating both the explicit regularization-based prior and implicit learning-based prior together to handle different regions in the image.

Activities

Member of the Program Committee (PC):

- The AAAI Conference on Artificial Intelligence (AAAI), 2020-2022

Area Chairs:

- IEEE International Conference on Multimedia & Expo (ICME), 2020

Reviewer for the following conferences:

- European Conf. on Computer Vision (ECCV), 2014, 2018, 2020
- IEEE Conf. on Computer Vision and Pattern Recognition (CVPR), 2014-2022
- Conference on Neural Information Processing Systems (NeurIPS), 2016
- IEEE Int'l Conf. on Computer Vision (ICCV), 2017, 2019, 2021
- British Machine Vision Conference (BMVC), 2019
- International Conference on Learning Representations (ICLR), 2022

Reviewer for the following journals:

- IEEE Trans on Pattern Analysis and Machine Intelligence (IEEE T-PAMI) *2015-present*
- IEEE Trans on Circuits and Systems for Video Technology (IEEE TCSVT) *2016-present*
- IEEE Trans on Image Processing (IEEE-TIP) *2017-present*
- Computer Vision and Image Understanding (CVIU) *2018-present*
- IEEE Transactions on Information Forensics & Security (IEEE T-IFS) *2019-present*
- International Journal of Computer Vision (IJCV) *2019-present*
- Signal, Image and Video Processing (SIVP) *2019-present*
- Neurocomputing (NEUCOM) *2020-present*

Awards and Honors

The National Encouragement Scholarship, Tsinghua University *2010*

Academic Excellence Award, Tsinghua University *2011*

Outstanding Graduate Scholarship, Tsinghua University *2013*

The Murphy Fellowship, Northwestern University *2014*

Terminal Year Fellowship, Northwestern University *2018*

Selected and Submitted Publications **(240 citations, h-index=9, i10-index=9)**

1. Bing Su, **Jiahuan Zhou***, Jirong Wen, and Ying Wu. Linear and Deep Order-Preserving Wasserstein Discriminant Analysis. In IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2021 **(*Corresponding Author)**

2. **Jiahuan Zhou**, Bing Su, and Ying Wu. Online Joint Multi-Metric Adaptation from Frequent Sharing-Subset Mining for Person Re-Identification. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR'20), Seattle, USA, June. 2020.

3. Yansong Tang*, Zanlin Ni*, **Jiahuan Zhou**, Danyang Zhang, Jiwen Lu, Ying Wu, Jie Zhou. Uncertainty-aware Score Distribution Learning for Action Quality Assessment. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR'20), Seattle, USA, June. 2020. (* Equal Contribution)

4. Bing Su, **Jiahuan Zhou**, and Ying Wu. Order-preserving Wasserstein Discriminant Analysis. In Proceedings of IEEE International Conference on Computer Vision (ICCV'19), Seoul, Korea, Oct. 2019.

5. Xu Zou, Sheng Zhong, Luxin Yan, Xiangyun Zhao, **Jiahuan Zhou*** and Ying Wu. Learning Robust Facial Landmark Detection via Hierarchical Structured Ensemble. In Proceedings of IEEE International Conference on Computer Vision (ICCV'19), Seoul, Korea, Oct. 2019. **(*Corresponding author)**

6. **Jiahuan Zhou** and Ying Wu. Learning Visual Instance Retrieval from Failure: Efficient Online Local Metric Adaptation from Negative Samples. In IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2019.

7. Xinzhao Li, Yuehu Liu, Zeqi Chen, **Jiahuan Zhou** and Ying Wu. Fused Discriminative Metric Learning for Low Resolution Pedestrian Detection. In Proceedings of IEEE International Conference on Image Processing (ICIP'18), Athens, Greece, Oct. 2018.

8. **Jiahuan Zhou**, Bing Su, and Ying Wu. Easy Identification from Better Constraints: Multi-Shot Person Re-Identification from Reference Constraints. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR'18), Salt Lake City, USA, June. 2018.

9. **Jiahuan Zhou**, Pei Yu, Tang Wei, and Ying Wu. Efficient Online Local Metric Adaptation via Negative Samples for Person Re-Identification. In Proceedings of IEEE International Conference on Computer Vision (ICCV'17), Venice, Italy, Oct. 2017.

10. Wei Tang, Pei Yu, **Jiahuan Zhou**, and Ying Wu. Towards a Unified Compositional Model for Visual Pattern Modeling. In Proceedings of International Conference on Computer Vision (ICCV'17), Venice, Italy, Oct. 2017.

11. Bing Su, **Jiahuan Zhou**, Xiaoqing Ding, and Ying Wu. Unsupervised Hierarchical Dynamic Parsing and Encoding for Action Recognition. In IEEE Transactions on Image Processing, 26.12 (2017): 5784-5799.

12. Bing Su, **Jiahuan Zhou**, Xiaoqing Ding, Hao Wang, and Ying Wu, Hierarchical Dynamic Parsing and Encoding for Action Recognition. In Proc. European Conf. on Computer Vision (ECCV'16), Amsterdam, Netherlands, Oct. 2016.

13. Pei Yu, **Jiahuan Zhou**, and Ying Wu. Learning Reconstruction-based Gaze Estimation. In Proc. IEEE Conf. on Computer Vision and Pattern Recognition (CVPR'16), Las Vegas, USA, June. 2016.

14. **Jiahuan Zhou**, and Ying Wu. Finding the Right Exemplars for Reconstructing Single Image Super-Resolution. In Proc. IEEE Int'l Conf. on Image Processing (ICIP'16), Phoenix, USA, Sep. 2016. **(Oral)**

15. Han Hu, **Jiahuan Zhou**, Jianjiang Feng, and Jie Zhou. Multi-way Constrained Spectral Clustering via Nonnegative Restriction. In Proceeding of International Conference on Pattern Recognition (ICPR'12), Tsukuba, Japan, Nov. 2012. **(Oral)**

Teaching Experience

Teaching Assistant, Northwestern University *Feb, 2014 – June, 2014*
Course: ELEC-ENG 211, Fundamentals of Computer Programming II
Responsibilities:

- Hold the weekly discussion sections and office hours for about 80 students.
- Evaluate and provide constant support to students for 5-6 programming assignments.

Head Teaching Assistant, Northwestern University *Mar, 2017 – June, 2017*
Course: ELEC-ENG 212, Mathematical Foundations of Computer Science
Responsibilities:

- Assist the in-class teaching and after-class discussion classes for about 120 students.
- Design and evaluate homework, exams and final projects.
- Hold the weekly office hour sessions.

Guest Lecturer, Northwestern University *Winter, 2019*
Course: ELEC-ENG 432, Advanced Computer Vision
Responsibilities:

- Invited to deliver the lectures of the online learning research works to graduate students.

Guest Lecturer, Northwestern University *Fall, 2020*
Course: ELEC-ENG 332, Introduction to Computer Vision
Responsibilities:

- Invited to deliver the lectures of the person re-identification research works to graduate students.

Guest Lecturer, Northwestern University *Winter, 2020*
Course: ELEC-ENG 433, Statistical Pattern Recognition
Responsibilities:

- Invited to deliver the lectures of pattern recognition methods to graduate students.

Mentoring Experience

Mentor for Tianqi Liu, Northwestern University Master Student *Dec,2018 - June,2019*
Current Status: Ph.D. Student in University of Florida

Mentor for Jian Xu, Northwestern University Master Student *Dec,2018 - June,2020*
Current Status: ByteDance Ltd. in Beijing

Mentor for Yuxiang Guo, Northwestern University Master Student *Sep,2020 - June,2021*
Current Status: Ph.D. Student in Johns Hopkins University