Yuqian Zhou

Email | Homepage | Google Scholar | Github | Linkedin

RESEARCH INTEREST

My current research focuses on image restoration, generation and editing. I am also interested in multi-view computer vision and structure analysis from image collections. I am actively conducting research on computer vision algorithm with limited-quality inputs, and doing inter-disciplinary research like medical image analysis.

EDUCATION

University of Illinois at Urbana-Champaign (UIUC), *Aug. 2017 - Present*
Image Formation and Processing Group (IFP), Beckman Institute
Advisor: Prof. Thomas Huang (1936-2020), Prof. Mark Hasegawa-Johnson
Doctor of Philosophy (Ph.D.) ABD in Electrical and Computer Engineering
Cumulative GPA: 4.0/4.0

The Hong Kong University of Science and Technology (HKUST), *Aug. 2015 - Aug. 2017*
Neuromorphic Interactive System Lab, ECE
Advisor: Prof. Bertram Shi
Master of Philosophy (M.Phil.) in Electronics and Computer Engineering
Cumulative GPA: 4.04/4.3
Thesis: Facial Expression Analysis Based on Deep Networks: from Recognition to Generation

The Hong Kong University of Science and Technology (HKUST), *Aug. 2013 - Aug. 2015*
Winner of the 2015 HKUST Academic Achievement Medal
Bachelor of Engineering (B.Eng.) in Computer Engineering
Cumulative GPA: 4.086/4.3, Ranking: 1/130

Sun Yat Sen University (SYSU), Guangzhou, China *Aug. 2011 - Aug. 2013*
Undergraduate Student in Computer Science
Cumulative GPA: 3.8/4.0, Ranking: 1/20

Peking University, China *Jul. 2014 - Aug. 2014*
Globex Engineering School Summer Exchange Program
Courses: Nanomedicine

PROFESSIONAL APPOINTMENTS

Research Assistant Aug. 2017 - Present
@ ***Image Formation and Processing (IFP) Group****, UIUC, supervised by Mark Hasegawa-Johnson*

- Image Processing and Restoration, Human-computer Interaction, Medical Imaging

Research Intern May. 2020 - present
@ ***Adobe Research*** *&* ***Adobe Photoshop*** *with Sohrab Amirghodsi, Connelly Barnes, Eli Shechtman*

- Improving Photoshop Content-Aware Fill and Multi-Source Image Inpainting

Research Intern May. 2019 - Aug. 2019
@ ***Microsoft Applied Science Group*** *&* ***Microsoft Research*** *with Tim Large*

- Image Restoration for Under-Display Camera

Research Intern May. 2018 - Aug. 2018
@ ***Megvii co. USA Research*** *with Jue Wang*

- Real-world Image Blind Denoising and Deformable Style Transfer

Research Assistant Aug. 2017 - Aug. 2018
@ ***Jump Trading Research Lab*** *with Ken Terao*

- Single-stock and Multi-stock High-Frequency Trading Algorithm

Research Assistant Aug. 2015 - Aug. 2017
@ ***Neruomorphic Interactive System Lab****, HKUST, with Bertram Shi*

- Affective Computing and Intelligent Robotics

PUBLICATIONS

Conference Publications:

1. **Y. Zhou**, H. Yu, H. Shi, "Study Group Learning: Improving Retinal Vessel Segmentation Trained with Noisy Labels, *International Conference on Medical Image Computing and Computer-Assisted Intervention (**MICCAI**)*, 2021
2. **Y. Zhou**, C. Barnes, E. Shechtman, S. Amirghodsi, "TransFill: Reference-guided Image Inpainting by Merging Multiple Color and Spatial Transformations", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2021.
3. **Y. Zhou**, D. Ren, N. Emerton, S. Lim, T. Large, "Image Restoration for Under-Display Camera",*IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2021.
4. Y. Mei, Y. Fan, **Y. Zhou**."Image Super-Resolution with Non-Local Sparse Attention", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2021.
5. H. Yu, N. Xu, Z. Huang, **Y. Zhou**, H. Shi, "High-Resolution Deep Image Matting", *The AAAI Conference on Artificial Intelligence (**AAAI**)*, 2021.
6. Y. Mei, Y. Fan, **Y. Zhou**, L. Huang, T. Huang, H. Shi, "Image Super-Resolution with Cross-Scale Non-Local Attention and Exhaustive Self-Exemplars Mining", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2020.
7. **Y. Zhou**, J. Jiao, H. Huang, Y. Wang, J. Wang, H. Shi, T. Huang, "When AWGN-based Denoiser Meets Real Noises", *The AAAI Conference on Artificial Intelligence (**AAAI**)*, 2020.
8. K. Gu, **Y. Zhou**[1], T. Huang, "FLNet: Landmark Driven Fetching and Learning Network for Faithful Talking Facial Animation Synthesis", *The AAAI Conference on Artificial Intelligence (**AAAI**)*, 2020.
9. D. Deng, Z. Chen, **Y. Zhou**, B. Shi, "Integrating Micro- and Macro-motion for Video Emotion Recognition", *The AAAI Conference on Artificial Intelligence (**AAAI**)*, 2020.
10. Y. Fu, Y. Wei, G. Wang, **Y. Zhou**, H. Shi, T. Huang, "Self-similarity Grouping: A Simple Unsupervised Cross Domain Adaptation Approach for Person Re-identification", *IEEE International Conference on Computer Vision (**ICCV**)*, 2019. **[Oral]**
11. T. He, H. Huang, L. Yi, **Y. Zhou**, C. Wu, J. Wang, S. Soatto, "GeoNet: Deep Geodesic Networks for Point Cloud Analysis", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**)*, 2019. **[Oral]**
12. Y. Fu, Y. Wei, **Y. Zhou**, H. Shi, G. Huang, X. Wang, Z. Yao, T. Huang, "Horizontal Pyramid Matching for Person Re-identification", *The AAAI Conference on Artificial Intelligence (**AAAI**)*, 2019.

[1]Corresponding Author

13. **Y. Zhou**, K. Gu, T. Huang, "Unsupervised Representation Adversarial Learning Network: from Reconstruction to Generation", *The International Joint Conference on Neural Networks (**IJCNN**)*, 2019. **[Oral]**

14. **Y. Zhou**, D. Liu, T. Huang, "Survey of Face Detection on Low-quality Images", *IEEE International Conference on Automatic Face & Gesture Recognition (**FG**)*, 2018.

15. **Y. Zhou**, B. Shi, "Photorealistic Facial Expression Synthesis by the Conditional Difference Adversarial Autoencoder", *The International Conference on Affective Computing and Intelligent Interaction (**ACII**)*, 2017.

16. **Y. Zhou**, J. Pi, B. Shi, "Pose-independent Facial Action Unit Intensity Regression Based on Multi-task Deep Transfer Learning", *IEEE International Conference on Automatic Face & Gesture Recognition (**FG**)*, 2017. **[Winner of the FERA2017 Challenge] [Oral]**

17. **Y. Zhou**, B. Shi, "Action Unit Selective Feature Maps in Deep Networks for Facial Expression Recognition", *The International Joint Conference on Neural Networks (**IJCNN**)*, 2017. **[Oral]**

Journal Publications:

1. ***Y. Zhou**, *YW. Lin[2], F. Faghri, MJ. Shaw, RH. Campbell, "Analysis and Prediction of Unplanned Intensive Care Unit Readmission using Recurrent Neural Networks with Long Short-Term Memory", *PLoS ONE*, July, 2018

Other Publications:

1. **Y. Zhou**, M. Kwan, K. Tolentino, N. Emerton, S. Lim, T. Large ... ,"UDC 2020 Challenge on Image Restoration of Under-Display Camera: Methods and Results", *European Conference on Computer Vision (**ECCV**) Workshop*, 2020. (Challenge Report)

2. S. Lim, **Y. Zhou**, N. Emerton, T. Large, S. Bathiche,"Image Restoration for Display-Integrated Camera", *SID Symposium Digest of Technical Papers*, 2020.

3. S. Lim, **Y. Zhou**, N. Emerton, T. Large,"Aperture Design for Learning-based Image Restoration", *3D Image Acquisition and Display: Technology, Perception and Applications*, 2020.

4. Y. Mei, Y. Fan, Y. Zhang, J. Yu, **Y. Zhou**, D. Liu, Y. Fu, T. Huang, H. Shi, "Pyramid Attention Networks for Image Restoration", *Technical Report*, 2020

5. **Y. Zhou**, J. Jiao, H. Huang, J. Wang, T. Huang, "Adaptation Strategies for Applying AWGN-based Denoiser to Realistic Noise", *The AAAI Conference on Artificial Intelligence (**AAAI**)*, 2019. (Student Abstract)

6. J. Liu, CH. Wu, Y. Wang, Q. Xu, **Y. Zhou**, H. Huang, C. Wang, S. Cai, Y. Ding ... "Learning Raw Image Denoising with Bayer Pattern Unification and Bayer Preserving Augmentation", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshops*, 2019. **[Winner of NTIRE 2019 Raw Track]**. (Challenge Report)

7. A. Abdelhamed, ..., **Y. Zhou**,..., "NTIRE 2020 Challenge on Real Image Denoising: Dataset, Methods and Results", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshops*, 2020. (Challenge Report)

8. A. Abdelhamed, ..., **Y. Zhou**,..., "NTIRE 2019 Challenge on Real Image Denoising: Methods and Results", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**) Workshops*, 2019. (Challenge Report)

9. **Y. Zhou**, S. Lu, "Discovering Abnormal Patches and Transformations of Diabetic Retinopathy in Big Fundus Collections", *Computer Science & Information Technology*, 2017.

[2]Equal Contributions

10. **Y. Zhou**, "Pro-ISIS Fanboys Network Analysis and Attack Detection through Twitter Data", *IEEE 2nd International Conference on Big Data Analysis (**ICBDA**)*, 2017.

BOOKS

1. **Y. Zhou**, "Thirteen days travel to the U.S.", 2006, ISBN:9787270206070

PATENT

1. "Deep learning based Multi-homography Fused Multi-source Image Inpainting", *US Patent filed*, 2020 (Filed with Adobe Inc.)
2. "Image Restoration for Through-display Imaging", *US Patent filed*, 2019 (Filed with Microsoft)

DATASET AND SOFTWARE

1. Codes associated with the publications are open-sourced at my Github page.
2. "Testing Dataset for Reference-based Image Inpainting", *released*, Adobe Research, 2021
3. "Under-Display Camera Dataset for T-OLED and P-OLED", *released*, Microsoft Applied Science Group, 2021
4. "Generalized Image Restoration Toolbox", *in preparation*, UIUC, 2019-present

AWARDS, HONORS AND SCHOLARSHIP

Research and Challenge Awards:

- 5th Place of NTIRE2020 sRGB Image Denoising Challenge at CVPR 2020 — Apr. 2020
- 3rd Place of Dunhuang e-Heritage Challenge at ICCV 2019 — Aug. 2019
- 1st Place of NTIRE2019 Raw Image Denoising Challenge at CVPR 2019 — Jun. 2019
- 3rd Price of the 15th 'Challenge Cup' of China — Nov. 2017
- 1st Place of 2017 Facial Expression Recognition Challenge (FERA2017) — Jun. 2017
- Best Oral Paper of ICBDA 2017 — Mar. 2015
- Finalist of Three-Minute-Thesis(3MT) Challenge of HKUST — Dec. 2015
- 3rd Price at ACM Competition of SYSU — Mar. 2012

Grants and Fellowship:

- Thomas and Margaret Huang Award for Graduate Research — Apr. 2020
- AAAI'20 Student Grants — Jan. 2020
- Postgraduate Studentship of HKUST — Aug. 2015 - Aug. 2017
- First-class Scholarship Scheme for Continuing UG Students of HKUST — Aug. 2014
- HKTIIT Scholarship — Aug. 2014
- First-class Scholarship of SYSU — Aug. 2013
- Jerry Yan Scholarship — Aug. 2013
- Soong Ching Ling Scholarship — Aug. 2006

Earlier Recognition:

- 2015 Academic Achievement Medal of HKUST (top 0.1%) — Nov. 2015
- 2015 HKUST Outstanding Student (top 1%) — May 2015
- 2015 HKUST Academic Excellence Award (top 5%) — May 2015
- HKUST Dean's List (top 10%) — Sep. 2015
- HKUST Dean's List (top 10%) — Sep. 2014
- HKUST Dean's List (top 10%) — May 2014

Selected Media Coverage:

- Awared the Thomas and Margaret Huang Award for Graduate Research, "Beckman spring award, fellowship recipients announced", Beckman Institute, UIUC headlines, 2020.
- High Resolution Image Matting is highlighted and covered by The Heart of Machine, "It's not enough to cut out the fineness to the hair. Adobe's new method can process 6000×6000 high-resolution images", The Heart of Machine Headlines, (in Chinese), 2021.
- Our Under-Display Camera Project is covered by Sparrows News, "Microsoft's AI Repair Program will Solve Blurring Problem Of In-display Camera", 2020
- The Under-Display Camera Research is highlighted at Microsoft Applied Science Group Project Pages, "Camera In Display", Microsoft Headlines, 2020
- Won the Challenge of NTIRE 2019 on the Track of RAW Image Denoising, "CVPR 2019, How the Megvii Research Winning 6 Championships Builds Algorithmic Barriers", The Heart of Machine Headlines, (in Chinese), 2019. Also by Megvii Research Headlines.
- Won the Facial Expression Recognition Challenge, "ECE PG Students Won the Action Unit Intensity Estimation Sub-challenge in the Facial Expression Recognition and Analysis Challenge 2017", ECE headlines by HKUST, 2017
- The book written by me when I was 16-year-old was covered by local media, "Visiting the United States for 13 days, 16-year-old middle school student completed a 100,000-word book", 2006

PRESENTATIONS

Selected Invited Talks:

- *"Overview of Advanced Inpainting Methods"*, Adobe PatchMatch Meeting, virtual Jun. 2021
- *"Structural Inpainting with Rectification and Spatial Guidance"*, Adobe Photoshop Team Demo, virtual Jun. 2021
- *"TransFill: Reference-guided Image Inpainting"*, Adobe Tech Summit, virtual Jun. 2021
- *"Retinal Vessel Segmentation and topics with very-thin object segmentation"*, Adobe Research Project Meeting, virtual Apr. 2021
- *"Overview of Image Inpainting"*, SHI Lab Meeting at University of Oregon, virtual Mar. 2021
- *"Affective Computing and its Applications on Online Learning"*, School of Information Sciences of UIUC, virtual Mar. 2021
- *"Affective Computing on Online Learning"*, IBM Research, virtual Nov. 2020
- *"Challenge on Under-Display Camera"*, ECCV RLQ-TOD Workshop, virtual Aug. 2020
- *"Multi-source Inpainting"*, Adobe Intern Talk, virtual Aug. 2020
- *"Introduction to Low-quality Vision"*, ICCV RLQ Workshop, Seoul, Korea Oct. 2019
- *"Domain-adaptive Person Re-ID"*, ICCV WIDER Workshop, Seoul, Korea Oct. 2019
- *"Domain-adaptive Person Re-ID"*, ICCV Oral, Seoul, Korea Oct. 2019
- *"Under-Display Camera"*, IFP Group Meeting, Urbana, IL Sep. 2019
- *"Under-Display Camera"*, Microsoft Intern Talk, Redmond, WA Aug. 2019
- *"Deep AU-Selective Feature Maps for Expression Recognition"*, 16-th Japan-China-Korea Joint Workshop on Neurobiology and Neuroinformatics (NBNI 2016), HK, China Dec. 2016

MENTORING

- *Xu Ma*, Ph.D. NEU, June. 2021 - present
- *Jitesh Jain*, Undergrad, IIT, Mar. 2021 - present
- *Michael Kwan*, ECE Undergrad, UIUC, Sep. 2019 - present (After: CMU ECE Master Program)
- *Kyle Tolentino*, ECE Undergrad, UIUC, Sep. 2019 - present
- *Yiqun Mei*, ECE Undergrad, UIUC, Jan. 2020 - present (After: JHU PhD Program)

TEACHING

- Invited Lecturer, UIUC ARTD 499: Special Topics in Design - AI and Design (Fall 2021)
- Teaching Assistant, UIUC ECE 448: Artificial Intelligence (Spring 2020)

SERVICES

Main Program Organizer:

- ECCV Challenge on Under-Display Camera (UDC 2020), virtual, 2020
- ECCV Workshop on Real-World Recognition (RLQ-TOD 2020), virtual, 2020
- ICCV Workshop on Real-World Recognition (RLQ 2019), Seoul, Korea, 2019

Program Chair:

- IEEE International Conference on Big Data Analysis (ICBDA), Suzhou, China, 2019
- IEEE International Conference on Big Data Analysis (ICBDA), Shanghai, China, 2018
- IJCAI Affective Computing Workshop, virtual, 2020

Frequent Reviewer:

- Journal: TIP, Cybernetics, Computational Survey, Affective Computing, Visual Communication and Image Representation,*etc.*
- Conference: CVPR, ICCV, ECCV, NeurIPS, AAAI, ICLR, ICML, ACCV, WACV, MICCAI, *etc.*

Interviewer:

- HKUST Undergraduate Student Admission Interview after DSE

Volunteer:

- Animal Shelter Volunteer at Champaign, IL 2018
- Student Ambassador of New Semester Series Events 2015-2016
- International Volunteer of Maldives Environment Protection and Education 2012-2013
- Volunteered at the Anniversary of China-HK Scholar Association 2017
- Tutor in Hong Kong Tutor Association 2015-2017
- HKUST Exchange Student Partner 2013-2017
- Blood Donation at Harbin, China 2013

Miscellaneous:

- Chairman of the Maxcell Resourse Sharing Association at SYSU 2012-2013
- Group Leader of the Academic Department of SYSU Student Union 2011-2012
- Chairman of the Student Union of Harbin No.3 Senior High 2009-2010
- Delegate of Estonia at WHO of Harvard Model United Nations Conference Dec. 2010
- Academic Advisor of the Heilongjiang Model United Nations Conference Aug. 2010
- China-Denmark Culture Exchange Program Dec. 2009
- Junior Journalist of China-US Culture Exchange Program Dec. 2006