Yaping Zhao

Nationality: China, Ethnic Group: Zhuang (minority)
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Education

Tsinghua University (Ranked 15th in QS World 2021), China Aug. 2018 – Jun. 2021
M.S. in Data Science and Information Technology, Advisor: Prof. Lu Fang *GPA: 3.61/4.0*
Thesis: Cross-Camera Reference-based Video Processing and Synthesis
(Tsinghua University Outstanding Master Thesis Candidate, 14 of 128)

Beihang University (Ranked 151-200th in ARWU World 2020), China Aug. 2014 – Jun. 2018
B.S. in Information System, Minor in Mathematics, Advisor: Prof. Jichang Zhao *GPA: 3.6/4.0*
Thesis: A Real Estate Data Visualization System based on Multi-source Heterogeneous Data

Publications

- **Y. Zhao**, G. Li, H. Zheng, Z. Wang. TSAMT: Time-Series-Analysis-based Motion Transfer among Multiple Cameras, CSOE International Computational Imaging Conference (CITA), 2021. (**Oral**)
- Q. Yang, **Y. Zhao** (**Equal Contribution**). Revisit Dictionary Learning for Video Compressive Sensing under the Plug-and-Play Framework, SPIE Processing, 2021.
- **Y. Zhao**, M. Ji, R. Huang, B. Wang, S. Jin. EFENet: Reference-based Video Super-Resolution with Enhanced Flow Estimation, CAAI International Conference on Artificial Intelligence (CICAI), 2021.
- **Y. Zhao**, M. Ji, Y. Zhu, R. Huang, L. Fang, Cross-Camera Deep Colorization, IEEE Transactions on Imaging Processing (TIP, **impact factor: 9.340**), 2021 [under review].
- G. Li, **Y. Zhao**, M. Ji, X. Yuan, L. Fang. Zoom in to the Details of Human-centric Videos, the 27th IEEE International Conference on Image Processing (ICIP), 2020.

Patents

- L. Fang, J. Wen, C. Yuan, **Y. Zhao**, M. Ji, "A Cross-Scale Adaptive Information Mapping Imaging Method, Device and Medium," CN 202011249462.9.
- J. Zhao, **Y. Zhao**, H. Sheng, "A Real Estate Data Visualization System based on Multi-source Heterogeneous Data," CN 201810787881.4.
- L. Fang, J. Wen, C. Yuan, **Y. Zhao**, M. Ji, "A Light Field Super-Resolution Imaging System with Cross-Space-Time Mapping," to appear.

Software Copyrights

- **Y. Zhao**, J. Zhao, H. Sheng, "HouseFinder: A Multi-view Real Estate Data Visualization System," CN 2018SR632945. [Demo]

Selected Offers

The University of Notre Dame (Ranked 18th in U.S. News National 2021), US
Ph.D. in Computer Science
The University of Rochester (Ranked 5th in Computer Vision in CS Rankings US 2019), US
Ph.D. in Computer Science
Alibaba Group Holding Limited (China's E-Commerce and IT Giant), China
Computer Vision Algorithm Engineer

Selected Honors

Contests

- Meritorious Winner in Mathematical Contest in Modeling (MCM) (**worldwide**), 2016
- The Third Prize Award in the 5th Cross-Strait Market Survey and Analysis Contest (**nationwide**), 2016

Scholarship

- First Prize Scholarship in Academic Contest, Beihang University, 2016
- Fourth Prize Scholarship in Excellent Student, Beihang University, 2016
- Third Prize Scholarship in Social Practice, Beihang University, 2016

Social Practice

- The First Prize Award in the 2nd "Internet+" National College Students Innovation and Entrepreneurship Contest in Beijing Area (and The Silver Award **Nationwide**), 2016
- Bronze Award in the 10th "Challenge Cup" Undergraduate Entrepreneurship Contest (**nationwide**), 2016
- Silver Award in the 26th "Fengru Cup" Entrepreneurship Contest of Beihang University, 2016
- Silver Award in the 25th "Fengru Cup" Entrepreneurship Contest of Beihang University, 2015

Referees

- Prof. Lu Fang, fanglu@tsinghua.edu.cn, **Tsinghua University**, CN
- Prof. Ruqi Huang, ruqihuang@sz.tsinghua.edu.cn, **Tsinghua University**, CN
- Prof. Jichang Zhao, jichang@buaa.edu.cn, **Beihang University**, CN
- Prof. Mengqi Ji, mji@tsinghua.edu.cn, **Beihang University**, CN
- Prof. Chaoli Wang, chaoli.wang@nd.edu, **the University of Notre Dame**, US
- Dr. Haitian Zheng, hzheng15@ur.rochester.edu, **the University of Rochester**, US

Teaching Experience

Teaching Assistant | *Computational Photography (86000603-200), Tsinghua University* Mar. 2021 - Jun. 2021

*(Teaching and assessment throughout the course is undertaken **entirely in English**.)*

- Presented popular image-based algorithms, with an emphasis on using these techniques to build practical systems.
- Taught students to develop image analysis and synthesis tools to render and view scenes on computers.
- Checked and marked programming assignments.

Academic Activities

Talk

- CSOE International Computational Imaging Conference (CITA), 2021 | *Artificial Intelligence and Computational Imaging: Cross-Camera Video Processing and Synthesis*

Poster

- TBSI Workshop on Learning Theory (TBSI-WOLT), 2021 | *Cross-Camera Reference-based Video Processing and Synthesis*

Reviewer

- IEEE Winter Conference on Applications of Computer Vision (WACV) , 2022

Research Experience

Reference-based Video Super-Resolution with Enhanced Flow Estimation Aug. 2020 – Mar. 2021

- Proposed an end-to-end network with a novel flow refinement module, and effectively improves long sequence video synthesis quality for cross-scale camera systems.
- Proposed a flow refinement module that exploits globally the temporal information for flow enhancement, and therefore reduces alignment errors.
- Provided comprehensive evaluations to validate the strengths of our approach, and to demonstrate that the proposed framework outperforms the state-of-the-art methods.

Deep Interaction Patterns in Pedestrian Crowds May. 2020 – Sep. 2020

- Explored new ways for more realistic modeling of collective social behaviors, in particular of human crowds.
- Designed algorithm that recognizes weak interactions between pedestrian individuals from fine-grained human pose, especially facial key points and gestures.
- Designed social attribute descriptors to describe pedestrian group dynamics using social forces and elastic potential energies functions.

Cross-camera Deep Colorization Feb. 2020 – Aug. 2020

- Proposed a flexible and cost-effective imaging framework that transfers color across cameras. Our framework is applicable to various color-plus-mono camera settings with multiple resolution gaps. In particular, our method can adapt to both spatial and temporal resolution gap more than 8×.
- Proposed a deep learning approach for cross-camera colorization: our network contains an alignment module that generates dense correspondence for cross-camera alignment; a fusion module that compensates misalignment via visibility map computation and performs synthesis; the warping regularization improves the alignment learning.
- Verified substantial improvements of our method, *i.e.*, around 10dB PSNR gain over the state-of-the-art ones by extensive evaluation on a wide range of settings, *i.e.* different resolution gaps, viewpoints and temporal steps.

Action Quality Assessment in Sports Videos with Large Motion Variation Sep. 2019 – Jan. 2020

- Collect an Olympic events video dataset for automatic sport event scoring. Our dataset contains complex variations such as large motion, occlusion and person interaction.
- Enhanced the quality of the collected videos by non-rigid deformation and video super-resolution.
- Proposes a new approach for video-based sport event scoring. We integrate computer vision algorithm including detection, recognition, tracking and segmentation to handle the challenging sport videos with large deformation and fast movement.

Zoom in to the Details of Human-centric Videos Dec. 2018 – Jan. 2020

- Proposed a human-centric super-resolution algorithm that utilizes high-level prior defined by high-resolution human appearance.
- Proposed a motion analysis module that extracts inherent motion patterns from high-resolution reference videos to refine the pose estimation of the low-resolution sequences.
- Proposed a human body reconstruction module that maps high-resolution texture in the reference frames onto a 3D mesh model.

A Multi-view Real Estate Data Visualization System Dec. 2017 – Jun. 2018

- Developed web crawlers to collect multi-source heterogeneous data, designed a visualization system with user interface using the Flask-MongoDB framework, and analyzed data using statistical analysis.
- Utilized natural language processing methods for text-based data mining. Exploited techniques includes word frequency statistics analysis, word cloud generation, keyword extraction, topic model, emotion analysis. Furthermore, TF-IDF and TextRank are used to extract keywords.
- Combined regression analysis and principal component analysis for real estate price modeling. Identified the key factors that significant impact house price.

Skills

- **Programming Languages** | Python, C/C++, Java, SQL, HTML/CSS, JavaScript, Matlab
- **Speaking Languages** | Chinese, English, Cantonese, Zhuang language
- **Libraries** | PyTorch, NumPy, Matplotlib, OpenCV, TensorFlow, pandas
- **Frameworks** | Flask, Django, SSH, SSM