ZENG Jin
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SenseTime Research
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Profile

- **Research Focus:** graph signal processing, image processing, scene understanding, time-of-flight depth processing, deep learning
- **Career Objective:** a faculty position in multimedia processing, computer vision, AI, *etc.*

Work Experience

2018.2-present Researcher, SenseTime Research, Hong Kong

- Mobile image processing: portrait relighting, denoising, time-of-flight depth restoration
- Responsible for time-of-flight depth restoration from raw sensor data
- Responsible for portrait relighting algorithm development, released on OnePlus 6T

Education

2012.9-2018.1 PhD, Department of Electronic and Computer Engineering, HKUST

- Advisors: Prof. Khaled B. LETAIEF and Prof. Gene CHEUNG
- CGA: 3.883/4.3

2008.9-2012.6 B.Sc., School of Electronic Science and Engineering, Nanjing University

GPA: 4.6/5，Class Rank: 1/177

Visiting/Exchange Experience

2015.1-2016.1 & 2016.6-2017.6 Intern Student, National Institute of Informatics, Japan

- Supervised by Prof. Gene CHEUNG and Prof. Antonio ORTEGA, supported by Oversea Research Award granted by HKUST

2014.6-2014.8 Exchange Student, AOTULE program, Tokyo Institute of Technology, Japan

- Supervised by Prof. Yukihiko Yamashita, supported by JASSO scholarship

2010.9-2011.4 Exchange Student, OJS Program, University of Ottawa, Canada

Research/Project Experience

2018.12-now Deep Time-of-Flight (ToF) Depth Restoration

- Design the pipeline for ToF depth refinement from raw sensor measurement base on deep learning, solving for noise removal, multi-path inference and flying pixel reduction, *etc.*

2018.5-2018.12 Surface Normal Estimation with Hierarchical RGB-D Fusion

- Design a multiscale RGB-D fusion neural network for surface normal estimation with adaptive depth feature re-weighting and hybrid multiscale loss supervision

2018.2-2018.4 Real Image Denoising with Deep Graph Laplacian Regularization (GLR)

- Proposed a deep neural network design for real image denoising based on GLR

2017.2-2018.1 3D Point Cloud Denoising with Low-Dimensional Manifold Model

- Proposed a novel low-dimensional patch manifold model for 3D point cloud denoising

2017.1-2017.2 Hyperspectral Image Coding with Graph Wavelets

- Designed a low-complexity and high efficiency compression scheme for hyperspectral images via graph wavelets

2015.1-2017.1 Bipartite Subgraph Decomposition for Critically Sampled Graph Wavelet Filters

- Proposed NEW criteria for graph bipartition to promote compact signal representation in wavelet domain when applying critically sampled wavelet filterbanks on graphs

2014.5-2014.12 Subpixel Image Quality Assessment

- Proposed the FIRST comprehensive objective metric for subpixel images
- Conducted massive online user survey to obtain reliable data for metric training

2013.5-2014.4 Subpixel-based Image Downsampling

- Designed a subpixel image downsampling scheme that well balances the luminance sharpness and color fidelity of the resulting images based on subpixel-rendering

2012.2-2012.6 Stereoscopic Display of 3D Reconstruction Model, Bachelor Degree Thesis

- Developed a system for demonstrating 3D reconstruction result in a stereo fashion

2011.2-2011.4 Hand Rehabilitation Project, DISCOVER Lab, University of Ottawa

Journal Papers

Jin Zeng, Gene Cheung, Michael Ng, Jiahao Pang, Cheng Yang. "3D Point Cloud Denoising using Graph Laplacian Regularization of a Low Dimensional Manifold Model", submitted to *Trans. Image Processing*.

Jin Zeng, Gene Cheung, Antonio Orgeta, "Bipartite Approximation for Graph Wavelet Signal Decomposition", *IEEE Trans. Signal Processing*, 2017, 65(20), 5466-5480.

Jin Zeng, Lu Fang, Jiahao Pang, Houqiang Li, Feng Wu, "Subpixel Image Quality Assessment Syncretizing Local Subpixel and Global Pixel Features", *IEEE Trans. Image Processing*, 2016, 25(12): 5841-5856.

Jiahao Pang, Lu Fang, **Jin Zeng**, Yuanfang Guo, Ketan Tang, "Subpixel-based Image Scaling for Grid-like Subpixel Arrangements: a Generalized Continuous-domain Analysis Model," *IEEE Trans. Image Processing*, 25.3 (2016): 1017-1032.

Conference Papers

Jin Zeng, Jiahao Pang, Wenxiu Sun, Gene Cheung, and Ruichao Xiao. "Deep Graph Laplacian Regularization", submitted to *IEEE Conf. on Computer Vision and Pattern Recognition Workshop*, 2019

Jin Zeng, Yanfeng Tong, Yunmu Huang, Qiong Yan, Wenxiu Sun. "Surface Normal Estimation with Hierarchical RGB-D Fusion", to appear in *IEEE Conf. on Computer Vision and Pattern Recognition*, 2019.

Jiahao Pang, Wenxiu Sun, Chengxi Yang, Jimmy Ren, Ruichao Xiao, **Jin Zeng**, and Liang Lin. "Zoom and Learn: Generalizing Deep Stereo Matching to Novel Domains", *IEEE Conf. on Computer Vision and Pattern Recognition*, 2018.

Jin Zeng, Gene Cheung, Yung-Hsuan Chao, Ian Blanes, Joan Serra-Sagrista, Antonio Ortega, "Hyperspectral Image Coding Using Graph Wavelets", *IEEE Int. Conf. on Image Processing*, 2017.

Jin Zeng, Gene Cheung, Antonio Ortega, "Bipartite Subgraph Decomposition for Critically Sampled Wavelet Filterbanks on Arbitrary Graphs", *IEEE Int. Conf. on Acoustics, Speech and Signal Processing*, Shanghai, China, March, 2016.

Yonggen Ling, Oscar C. Au, Jiahao Pang, **Jin Zeng**, Yuan Yuan, Amin Zheng, "Image Colorization via Color Propagation and Rank Minimization", *IEEE Int. Conf. on Image Processing*, Quebec City, Canada, September, 2015.

Jiahao Pang, Oscar C. Au, Yukihiko Yamashita, Yonggen Ling, Yuanfang Guo, **Jin Zeng**, "Self-Similarity-Based Image Colorization", *IEEE Int. Conf. on Image Processing*, Paris, France, October, 2014.

Haiyan Yang, Oscar C. Au, **Jin Zeng**, Mengqi Ji, Yuan Yuan, Sunil Jaiswal, "A Comprehensive Study on Digital Image Matting", *IEEE China Summit and Int. Conf. on Signal and Information Processing*, Xi'an, China, July, 2014.

Jin Zeng, Oscar C. Au, Yuanfang Guo, Jiahao Pang, Ketan Tang, Yonggen Ling, "Analysis of Sampling Pattern and Luma-chroma Filter Design for Subpixel-based Image Downsampling", *IEEE Int. Conf. on Acoustics, Speech and Signal Processing*, Florence, Italy, May, 2014.

Wenjing Zhu, Oscar C. Au, Wei Dai, Haitao Yang, Rui Ma, Luheng Jia, **Jin Zeng**, Pengfei Wan, "Palette-based compound image compression in HEVC by exploiting non-local spatial correlation", *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*, Florence, Italy, May, 2014.

Jin Zeng, Oscar C. Au, Wei Dai, Yue Kong, Luheng Jia, Wenjing Zhu, "A Tutorial on Image/Video Coding Standards", *APSIPA Annual Summit and Conference (ASC*), Kaohsiung, Taiwan, November, 2013.

Yonggen Ling, Oscar C. Au, Ketan Tang, Jiahao Pang, **Jin Zeng**, Lu Fang, "An Analytical Study of Subpixel-based Image Down-sampling Patterns in Frequency Domain", *IEEE Int. Conf. on Visual Communications and Image Processing (VCIP)*, Kuching, Sarawak, Malaysia, November, 2013.

Teaching Assistant Experience

Spring 2012/13 Computer Communication Networks (ELEC4120), HKUST
Fall 2013/14 Computer Organization (ELEC2300), HKUST

Awards

2014.12 Oversea Research Awards, HKUST

2012.5 Outstanding Graduate, Nanjing University

2011.12/2010.12 1st prize of Renmin Scholarship, Nanjing University (top 3% student)

2011.9 National Undergraduate Electronic Design Contest, 1st Prize in Jiangsu Province

2009.11 **National Scholarship** (highest scholarship for undergraduates in China)

Skills

Language

- English (Fluent): TOEFL ibt: 113/120, GRE: 1390/1600, 4.0/6 (writing), CET4: 667/710, CET6: 595/710
- Mandarin (Native), Cantonese (Basic) , Japanese (Basic)

Programming Language

- Python, C++, Matlab, Java, Assembly language, Verilog HDL
- Deep learning platform: Tensorflow, Pytorch, Caffe