



Kai XU
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 Kai Xu

RESEARCH INTEREST

My current work is to develop prototypes for 3D pose estimation on resource-constrained devices such as AR glasses. My PhD research interest is energy-efficient image/video sensing, reconstruction and understanding in the compressed domain. The proposed techniques can be used on low-power and resource-constrained applications such as mobile phones, wearable devices, and mobile robots.

EDUCATION

Ph.D. in Computer Engineering (Computer Systems) 2015-2020
Arizona State University
Advisor: Fengbo Ren

M.S. in Electrical Engineering 2011-2014
University of Electronic Science and Technology of China

B.S. in Electrical and Electronics Engineering 2007-2011
Shandong University

WORK EXPERIENCE

Senior Software Engineer Current
OPPO
Palo Alto, California
Working on 3D pose estimation on mobile AR glasses and smart TV.

PhD Research Intern 2020
Kuaishou Technology
Palo Alto, California
Developed an audio-visual learning system.

PhD Research Intern 2019
Alibaba DAMO Academy
Sunnyvale, California
Developed an efficient data pre-processing pipeline for computer vision systems. Published one paper at CVPR 2020.

PhD Research Intern 2017
Samsung Research America
Mountain View, California
Developed a video understanding system for lipreading. Published one paper at FG 2018.

PUBLICATION

1. [Kai Xu](#), Minghai Qin, Fei Sun, Yuhao Wang, Yen-Kuang Chen, Fengbo Ren, "Learning in the Frequency Domain" In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020, work done during internship at Alibaba DAMO Academy.
2. [Kai Xu](#), Zhikang Zhang and Fengbo Ren, "LAPRAN: A Scalable Laplacian Pyramid Reconstructive Adversarial Network for Flexible Compressive Sensing Reconstruction" In *European Conference on Computer Vision (ECCV)*, 2018.

3. Kai XU, Dawei Li, Nick Cassimatis and Xiaolong Wang, "LCANet: End-to-End Lipreading with Cascaded Attention-CTC" *In IEEE International Conference on Automatic Face & Gesture Recognition (FG)*, 2018, poster spotlight, work done during internship at Samsung Research America.
4. Kai XU and Fengbo Ren, "CSVideoNet: A Real-time End-to-end Learning Framework for High-frame-rate Video Compressive Sensing" *In IEEE Winter Conference on Applications of Computer Vision (WACV)*, 2018.
5. Kai XU, Yixing Li, and Fengbo Ren, "A Data-Driven Compressive Sensing Framework Tailored for Energy-efficient Wearable Sensing" *In International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2017, oral.
6. Kai XU, Yixing Li, and Fengbo Ren, "An Energy-Efficient Compressive Sensing Framework Incorporating Online Dictionary Learning for Long-Term Wireless Health Monitoring" *In International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2016.
7. Zhikang Zhang, Kai XU, and Fengbo Ren, "CRA: A Generic Compression Ratio Adapter for End-To-End Data-Driven Image Compressive Sensing Reconstruction Frameworks" *In International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2020, oral.
8. Yixing Li, Zichuan Liu, Kai XU, Hao Yu, and Fengbo Ren, "A GPU-Outperforming FPGA Accelerator Architecture for Binary Convolutional Neural Networks)" *In ACM Journal on Emerging Technologies in Computing Systems (JETC)*, 2018.
9. Duo Lv, Kai XU, and Dijiang Huang, "A Data Driven In-Air-Handwriting Biometric Authentication System" *In International Joint Conference on Biometrics (IJCB)*, 2017.
10. Yixing Li, Zichuan Liu, Kai XU, and Fengbo Ren, "A 7.663-TOPS 8.2-W Energy-efficient FPGA Accelerator for Binary Convolutional Neural Networks (Abstract Only)" *In ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA)*, 2017.
11. Yuhao Wang, Xin Li, Kai XU, Fengbo Ren, H. Yu, "Data-Driven Sampling Matrix Boolean Optimization for Energy-Efficient Biomedical Signal Acquisition by Compressive Sensing" *In IEEE Transactions on Biomedical Circuits and Systems (TBioCAS)*, 2016.

PATENTS

1. Real-Time End-to-End Learning System for High-frame-Rate Video Compressive Sensing Network.
2. LAPRAN: A Scalable Laplacian Pyramid Reconstructive Adversarial Network for Flexible Compressive Sensing Reconstruction.
3. Static Channel Filtering in Frequency Domain.
4. Data Preprocessing and Data Augmentation in Frequency Domain.
5. Techniques for Determining Importance of Encoded Image Components for Artificial Intelligence Tasks.
6. Reconstructing Transformed Domain Information in Encoded Video Streams.
7. Techniques to Dynamically Gate Encoded Image Components for Artificial Intelligence Tasks.
8. Generic Compression Ratio Adapter for End-to-end Data-driven Compressive Sensing Reconstruction Frameworks.

PROPOSAL

1. Neural Network Based Video Compression: A Real-time End-to-end Learning Framework for High-Frame-Rate Camera, co-authored with Prof. Fengbo Ren, Google faculty research award, 2017.

HONORS

ASU Outstanding Computer Engineering PhD Student	2020-2021
ASU Completion Fellowship	2019-2020
ASU CIDSE Doctoral Fellowship	2019
ASU Engineering Graduate Fellowship	2020
CVPR Travel Grant	2020