YUANHAO WANG

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RESEARCH INTERSETS

Neural Representation, Computation Tomography, 3D Reconstruction, Computational Imaging

EDUCATION

King Abdullah University of Science and Technology *Sept. 2016-Present*
Ph.D. Candidate in Electronical and Computer Engineering Advisor: Dr. Wolfgang Heidrich

Tsinghua University *Sept. 2013-July 2016*
M.Eng. in Integrated Circuits Engineering Advisor: Dr. Shuguo Li

Beijing University of Posts and Telecommunications *Sept.2009-July 2013*
B.Eng. in Communication Engineering Advisor: Dr. Yitong Liu

RESEARCH INTERESTS

My research interests encompass a wide range of topics in computational photography, including image processing (ISP), 3D particle tracking velocimetry(PTV), and neural representation for tomography. Currently, I am mainly focusing on tomography reconstruction with high efficiency and the handling of large datasets.

SOFTWARE SKILLS

Computer Programming	C++, Cuda, C, Python, Matlab, Verilog, etc.
Tools & APIs	Paraview, Blender, Avizo, etc.

SELECTED PUBLICATIONS

Wang Y., Idoughi R, Rckert, D., Li. R., Heidrich, W. *Learning Adaptive Tensorial Density Fields for Clean Cryo-EM Reconstruction* . Under Submission. 2023.

Wang Y., Idoughi R, Rckert, D., Li. R., Heidrich, W. *Adaptive Differentiable Grids for a Cryo-Electron Tomography Reconstruction and Denoising* . Under Review. 2023.

Rckert, D., ***Wang Y.,***Li. R., Idoughi R, Heidrich, W. *NeAT: Neural Adaptive Tomography* [J] . ACM Trans. Graphics. 2022.

Qian G.*, ***Wang Y.****,* Gu J., Dong C., Heidrich. W, Ghanem B., Ren. J. *Rethinking Learning-based Demosaicing, Denoising, and Super-Resolution Pipeline* [C]. ICCP 2022 (Equal contribution).

Wang Y.,Idoughi R, Heidrich, W. *Joint Motion-Correction and Reconstruction in Cryo-EM Tomography* [C]. ICIP 2022 (Oral).

Li. R., Rckert, D., ***Wang Y.,***Idoughi R, Heidrich, W. *Neural Adaptive Scene Tracing (NAScenT)* [C] . VMV 2022.

Wang Y., Idoughi R, Heidrich, W. *Stereo Event-based Particle Tracking Velocimetry for 3D Fluid Flow Reconstruction*[C]. ECCV 2020.

Wang Y., Li S. *A high-speed digital true random number generator based on cross ring oscillator*[J]. IEICE Trans. on Fund. of Elec., Com. and Com. Sci., 2016, 99(4): 806-818.

RESEARCH EXPERIENCE

Neural representation of cryo tomography | C++ June 2021-Current
Visual Computing Center, KAUST

- Adpoted a non local method to deal with the noise in cryo tomography.
- Jointly learn and denoise the cryo tomography data.
- Proposed a Tensorial Density Field for fast and large cryo tomography.
- Proposed a Isotropic Fourier Prior to penalize the peak pattern in the reconstruction.

Motion compensation Electron Tomography | C++ Mar. 2020-June 2021
Visual Computing Center, KAUST

- Considered beam-induced motion in the reconstruction
- Implemented a plug and play prior to deal with noise in the electron tomography data.

Neural Adaptive tomography | C++ June 2021-Feb. 2022
Visual Computing Center, KAUST

- Visualized the reconstructed volume.
- Helped with the paper manuscript.

Rethink ISP pipeline | Python June. 2020-June 2022
Visual Computing Center, KAUST

- Proposed a Denoising(DN) → Superresolution(SR) → Demosaicking(DM) worked best in all pipeline.
- Released a PixelShift200 dataset, which sampled all the color channel using the PixelShift technique.
- Proposed our joint DN+SR → DM worked best in all learning based method (Joint and sequence.).

Stereo Event-Camera Particle Tracking Velocimetry | Matlab Oct. 2019-Mar.2020
Visual Computing Center, KAUST

- Proposed the first event-camera based stereo-PIV setup for measuring time-resolved fluid flow.
- Proposed an optimization framework to retrieve dense fluid velocity field from the events.

True Random Number Generator | Verilog July 2014 - July 2016
Institute of Microelectronics, Tsinghua University

- Designed a Cross Ring Oscillator based TRNG (CRTRNG). The CRTRNG gains **240Mbps** random number, while consuming only about **3000** logic elements on Altera Cyclone IV;
- Designed a **1Gbps** Cross Ring Oscillator based TRNG circuits based on SMIC 65nm.

ACADAMIC SERVICE

Reviewer CVPR, ECCV

AWARDS

The Second Prize in China Undergraduate Mathematical Contest in Modeling (2012)

Honorable Mention of Interdisciplinary Contest in Modeling(2012)

JDSU special Awards (aimed at the innovative programs, 2012)

SERVICE

Student Reporter	The Tsinghua University News Center	Sept. 2014-July 2015
Vice-Minister	The School's Youth League Committee in Tsinghua University	Mar. 2015-2016