

YUANHAO WANG

Website: <https://yuanhaowang1213.github.io> ◊ GitHub: <https://github.com/yuanhaowang1213>

WashU, USA ◊ Email: yuanhao@wustl.edu

RESEARCH INTERESTS

Neural Rendering, Diffusion Models, 3D Reconstruction and Computational Imaging, High-Performance Computing, Optimization

WORK EXPERIENCE

Washington University in St. Louis

Postdoc in Electronical and System Engineering

Key Projects: Diffusion models for inverse problems.

Nov. 2023-Present

Collaborator: Dr. Ulugbek Kamilov

EDUCATION

King Abdullah University of Science and Technology

Ph.D. in Electronical and Computer Engineering

Sept. 2016-Sept. 2023

Advisor: Dr. Wolfgang Heidrich

Tsinghua University

M.Eng. in Integrated Circuits Engineering

Sept. 2013-July 2016

Advisor: Dr. Shuguo Li

Beijing University of Posts and Telecommunications

B.Eng. in Communication Engineering

Sept. 2009-July 2013

Advisor: Dr. Yitong Liu

SOFTWARE SKILLS

Programming

C++, Libtorch, CUDA, Python, PyTorch, C, Matlab, Verilog

Tools & APIs:

Paraview, Blender, Avizo

SELECTED PUBLICATIONS

- [1] D. Rückert and **Wang, Yuanhao** and Li, Rui and Idoughi, Ramzi and Heidrich, Wolfgang, “NeAT: Neural Adaptive Tomography,” *ACM Trans. Graph.*, vol. 41, no. 4, Jul. 2022, [paper](#).
- [2] R. Li, D. Rückert, and **Wang, Yuanhao** and Idoughi, Ramzi and Heidrich, Wolfgang, “Neural adaptive scene tracing (nascent),” *VMV 2022*, <https://arxiv.org/abs/2202.13664>.
- [3] **Wang, Yuanhao** and Idoughi, Ramzi and Rückert, Darius and Li, Rui and Heidrich, Wolfgang, “Adaptive differentiable grids for cryo-electron tomography reconstruction and denoising,” *Bioinformatics Advances*, 2023, [paper](#).
- [4] **Wang, Yuanhao** and Idoughi, Ramzi and Heidrich, Wolfgang, “Learning adaptive tensorial density fields for clean cryo-et reconstruction,” *NeurIPS 2023*, [paper](#).
- [5] **Wang, Yuanhao** and Idoughi, Ramzi and Heidrich, Wolfgang, “Joint motion-correction and reconstruction in cryo-em tomography,” in *ICIP 2022 (Oral)*, 2022, pp. 1101–1105, [paper](#).
- [6] G. Qian* and **Wang, Yuanhao*** and Gu, Jinjin and Dong, Chao and Heidrich, Wolfgang and Ghanem, Bernard and Ren, Jimmy S, “Rethinking learning-based demosaicing, denoising, and super-resolution pipeline,” in *ICCP 2022 (equal contribution)*, [paper](#).
- [7] **Wang, Yuanhao** and Idoughi, Ramzi and Heidrich, Wolfgang, “Stereo event-based particle tracking velocimetry for 3d fluid flow reconstruction,” in *ECCV 2020*, 2020, pp. 36–53, [paper](#).
- [8] **Wang, Yuanhao** and Li, Shuguo, “A high-speed digital true random number generator based on cross ring oscillator,” *IEICE Trans. on Fund.of Elec., Com. and Com. Sci.*, vol. 99, no. 4, pp. 806–818, 2016, [paper](#).

RESEARCH EXPERIENCE

Diffusion model for inverse problems | Python, C++, Libtorch
WashU

June 2024-Now

- Developed a diff-unfolding method for general inverse problem.

Neural Representation on tomography [1, 2, 3, 4] | C++, Libtorch, CUDA
Visual Computing Center, KAUST

June 2021-Sept. 2023

- Formulated differentiable models and designed relevant priors using C++ and Libtorch.
- Developed an adaptive Density /Tensorial Density Field for efficient and large cryo-ET dataset.
- Implemented an Isotropic Fourier Prior to effectively mitigate peak patterns in the reconstruction.
- Visualized the reconstructed volumes with Avizo.

Motion compensation and reconstruction of cryo-ET [5] | C++, OpenMP
Visual Computing Center, KAUST

Mar. 2020-June 2021

- Considered beam-induced motion during the reconstruction.
- Utilized a plug-and-play prior to address noise in the electron tomography data.

Rethink ISP pipeline [6] | Python, Pytorch
Visual Computing Center, KAUST

June. 2020-June 2022

- Proposed a Denoising(DN) → Superresolution(SR) → Demosaicking(DM) worked best in all sequential pipelines.
- Released PixelShift200 dataset for color channel sampling.

Stereo Event-Camera Particle Tracking Velocimetry [7] | Matlab
Visual Computing Center, KAUST

Oct. 2019-Mar.2020

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

True Random Number Generator [8] | Verilog
Institute of Microelectronics, Tsinghua University

July 2014 - July 2016

- 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.
- Developed a **1Gbps** Cross Ring Oscillator based TRNG circuits based on SMIC 65nm.

ACADAMIC SERVICES

Reviewer CVPR, ECCV, ICCV, TVCG, TCI, MRM, Experiments in Fluids

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)