XINGE YANG

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Homepage: singer-yang.github.io ◇ Google scholar: google scholar

EDUCATION

Ph.D, King Abdullah University of Science and Technology (KAUST) 06/2022 - Now
Computer Science. Advisor: Wolfgang Heidrich

M.Sc, King Abdullah University of Science and Technology (KAUST) 08/2020 - 06/2022
Computer Science. Advisor: Wolfgang Heidrich
Thesis: Automatic Lens Design based on Differentiable Ray-tracing.

B.Sc, University of Science and Technology of China (USTC) 09/2016 - 07/2020
Physics (major) and Computer Science (minor).

RESEARCH INTERESTS

My research focuses on building a differentiable ray tracer, **DeepLens**. DeepLens is an End-to-End computational optical design framework that bridges 3D scenes, optical lenses, and downstream computer vision algorithms. DeepLens can: (1) automatically design lenses from scratch, (2) design lenses using image-based loss functions, (3) simulate complex optical phenomena in 3D scenes, (4) incorporate refractive, reflective, and diffractive optical elements, (5) implicitly represent real optical lenses.

PUBLICATIONS

Image Quality Is Not All You Want: Task-Driven Lens Design for Image Classification Arxiv 2023
Xinge Yang, Qiang Fu, Yunfeng Nie, Wolfgang Heidrich.

Aberration Aware Depth from Defocus ICCP & TPAMI 2023
Xinge Yang, Qiang Fu, Mohammed Elhoseiny, Wolfgang Heidrich.

Curriculum Learning for *ab initio* Deep Learned Refractive Optics Arxiv 2023
Xinge Yang, Qiang Fu, Wolfgang Heidrich.

RESEARCH AND WORK EXPERIENCE

Ms/PhD Student: Computational Imaging 08/2020 - Now
VCC Computational Imaging Group, KAUST | Thuwal, Saudi Arabia

- Develop a differentiable ray tracer **DeepLens** based on an open-source library **dO**. Build an End-to-End optical design framework with differentiable scene-optics-network simulation.
- Apply DeepLens to automatically design both classical lenses and computational lenses (extended depth-of-field lens and image classification lens).
- Propose implicit lens models to efficiently integrate real lenses into image simulation and optics-aware network training.

Research Intern: Quantum Optics 07/2019 - 09/2019
Quantum Photonics Lab, NTU | Singapore

- Build and align experimental optical paths to measure the optically detected magnetic resonance of the 4H-SiC material at room temperature.

Research Intern: Computational Imaging 08/2018 - 09/2018
Shanghai Institute for Advanced Studies, USTC | Shanghai, China

· Simulate the underwater scattering imaging process and re-implement a single-photon image reconstruction algorithm in MATLAB.

TEACHING EXPERIENCE

Teaching Assistant - GAMES 204: Computational Imaging 09/2022 - 12/2022
Chinese Graphics And Mixed Environment Symposium (GAMES) Webinar | Online

Develop and grade assignments on computational imaging topics, including image signal processing, high dynamic range imaging, tone mapping, image deblurring, and multi-image fusion.

TECHNICAL SKILLS

Programming: Python, C/C++, MATLAB, CUDA
Platform and tools: PyTorch, ZEMAX, Mitsuba2, OpenGL

SERVICES

Reviewer: IEEE TPAMI, Optica, Optics Express.