Florian A. **Schiffers**

Machine Learning · Computational Photography · Ph.D. in Computer Science

(+1) 872 2356608 | florianschiffers@gmail.com | florianschiffers | Google Scholar

I am a **Vision Scientist** specializing in **AI-Driven Imaging**, with contributions to major venues like SIGGRAPH, ICCV, ICCP, and Nature. My expertise spans **Machine Learning, Image Reconstruction, Optical Systems, and Computational Photography**. I excel in developing effective AI models from limited data, which sets me apart in **Solving Practical Problems**. In addition to my engineering pursuits, my passion for teaching and mentoring has helped me develop strong leadership and communication skills, enabling me to effectively guide and motivate my peers.

Education

Ph.D. in Computer Science Northwestern University *with Prof. Oliver Cossairt and Prof. Aggelos Katsaggelos* — *Evanston, USA*
Machine Learning driven Algorithms for Co-Design of Hardware and Software in Computational Imaging and Display — *09/2018–12/2024*

M.Sc. in Physics and M.Sc. (Hons.) in Advanced Optical Technologies FAU Erlangen — *Erlangen, Germany*
Specialized in Medical and Computational Physics, Image Processing, Machine Learning, and Computational Optics — *10/2014–07/2017*

Erasmus Exchange Study Abroad Programs (7 months each) — *France and Spain*
at Universite de Bordeaux, France *(Computer Graphics)* and Universidad de Cantabria, Spain *(Photonics)* — *2014 and 2016*

Scientific and Working Experience

Meta Reality Labs (DSR) Research Intern *with Oliver Cossairt and Douglas Lanman* — *Seattle, WA, USA*
Developed and Evaluated ML-Algorithms for Reducing Noise in Holographic Display using Hyperspectral Multiplexing — *12/2023–05/2024*
Designed and Implemented the Optical Benchtop-Prototype and Evaluated the Experimental Performance compared to Baseline Literature

Meta Reality Labs (DSR)) Research Intern *with Nathan Matsuda and Grace Kuo* — *Remote Internship*
Developed AI-driven Phase-Retrieval Algorithms for Holographic 3D Displays via Lightfield Supervision — *09/2022–03/2023*
Created an OpenSource Automatic Differentiation Framework for AI-inspired Computational Imaging And Display — *09/2021–03/2022*

Department of Biomedical Engineering, Peking University Research Stay *with Prof. Qiushi Ren* — *Peking, China*
Developed Generative AI *(GAN)* for Medical Applications in Ophthalmology *(Fundus Imaging)* — *03/2017–12/2017*

Siemens Healthineers Research Scientist *with Thomas Pheiffer and Philip Mewes* — *Forchheim, Germany*
Implemented Algorithms for Robotic Navigation Prototypes for Image-Guided Spine Surgery *(Matlab, KUKA KRL, Java)* — *01/2018–04/2018*
Evaluated Registration/Segmentation Techniques for Robotic Navigation in Minimal Invasive Liver Surgery *(Matlab, Python, C++)* — *03/2016–05/2017*

Pattern Recognition Lab, FAU Erlangen-Nuremberg Master thesis *with Prof. Andreas Maier* — *Erlangen, Germany*
Developed Reconstruction Algorithms *(in Java)* for Grating-Based X-Ray Tomography — *04/2016–06/2017*

Institute for Optics, FAU Erlangen-Nuremberg Research Assistant *with Prof. Gerd Häusler* — *Erlangen, Germany*
Investigation of the Physical and Information Theoretical Limits of Optical 3D-sensing with Structured Light — *07/2012–10/2015*

Skills

Programming Python, Matlab, Java, CUDA, C/C++, GIT, Linux, HPC/SLURM
Machine Learning PyTorch, Lightning, Deep Learning, Generative Models, Optimization
Computer Vision Image Processing *(OpenCV, Kornia)*, Medical Imaging *(Segmentation, Reconstruction)*, Neural Rendering *(NERFs)*
Languages German *(native)*, English *(professional)*, French *(limited)*, Spanish *(limited)*, Chinese *(basic use)*

Other Accomplishments

Teaching Experience Taught and developed multiple courses as Full Instructor from 2020-2024 at Northwestern University: *Machine Learning, Computational Photography and two seminar series (Computer Graphics, Computational Optics)*
Student Supervision Supervised multiple Master's Theses and Individual Research Projects (*Various topics in Computational Imaging, Computer Graphics, Medical Imaging Deep Learning, and 3D Imaging and Display technologies)*
Awards and Funding Secured about $20000 in funding from DAAD-IFI, Northwestern Alumnae, and various student awards

Open-Source Projects

HoloTorch AI-powered Framework for Coherent Imaging and Display using PyTorch and Lightning
SkinScan Python Framework for Optical 3D reconstruction using various Structured Light Techniques
Sinogram Inpainting Physics-inspired Image Reconstruction Framework for X-ray Tomography using PyTorch

Selected Publications (~30 publications in total)

HoloChrome: Polychromatic Illumination for Speckle Reduction in Holographic Displays Submitted — *Journal*
F. Schiffers, N. Matsuda, G. Kuo, D. Lanman, O. Cosairt — *November 2024*

SeLFVi: Self-Supervised Light-Field Video Reconstruction From Stereo Video — *ICCV 2021*
P. Shedligeri, **F. Schiffers**, S. Ghosh, O. Cossairt, K. Mitra — *September 2021*

Computationally Efficient IMplicit Training Strategy for UNrolled NEtworks (IMUNNE) — *IEEE TBME*
N. Iakovlev, **F. Schiffers**, ..., A. Katsaggelos, D. Kim — *July 2024*

Multisource holography — *SIGGRAPH ASIA 2023*
G. Kuo, **F. Schiffers**, D. Lanman, O. Cossairt, N. Matsuda — *December 2023*

Stochastic Light Field Holography — *ICCP 2023*
F. Schiffers, P. Chakravarthula, N. Matsuda, G. Kuo, E. Tseng, D. Lanman, F. Heide, O. Cossairt — *July 2023*