

Florian A. Schiffers

MACHINE LEARNING · COMPUTER VISION · COMPUTATIONAL PHOTOGRAPHY · PH.D. IN COMPUTER SCIENCE

☎ (+1) 872 2356608 | ✉ florianschiffers@gmail.com | 🏠 www.florianschiffers.com | 📄 florianschiffers | 🎓 Google Scholar

Vision scientist specializing in **AI-driven algorithms** for computational imaging, 3D reconstruction, and optical systems. Leveraging my **physics** background, I bridge **machine learning** with **imaging** to enhance machine perception. Contributing to SIGGRAPH, ICCV, or ICCP, I've advanced techniques in **3D-Vision** and **display**. Passionate about teaching and mentoring, I've developed strong **leadership** and **communication** skills.

Education

Ph.D. in Computer Science NORTHWESTERN UNIVERSITY with Prof. Oliver Cossairt AND Prof. Aggelos Katsaggelos Evanston, USA

Thesis: Machine learning algorithms for hardware/software co-design of computational imaging and display 09/2018–12/2024

Led cross-functional development of a 3D CT scanner and CV algorithms to analyze large 4D datasets for swarm robotics inspired by army ants

Led interdisciplinary team on deep learning in cardiac imaging, resulting in publications on segmentation and reconstruction

Managed projects with industry partners (*Sony, Meta, Zoloz*) and communicated research milestones through publications and presentations

Implemented multiview appearance models (e.g. *Lightfield and NeRF*) to learn physical diffraction processes for creating realistic 3D images

M.Sc. in Physics and M.Sc. (Hons.) in Advanced Optical Technologies FAU ERLANGEN Erlangen, Germany

Specialization: Medical and computational physics, image processing, machine learning, 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 (Display System Research) 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 optical benchtop-prototypes and evaluated the experimental performance against baseline literature

Meta Reality Labs (Display System Research) RESEARCH INTERN with Nathan Matsuda and Grace Kuo Remote Internship

Developed AI-driven phase-retrieval algorithms for holographic 3D Displays via light-field supervision 09/2022–03/2023

Created an open-source automatic differentiation framework for AI-inspired computational imaging and display

Department of Biomedical Engineering, Peking University RESEARCH STAY with Prof. Qiushi Ren Peking, China

Developed generative AI (*GAN*) for medical applications in pphthalmology (*Fundus Imaging*) 03/2017–12/2017

Siemens Healthineers (Therapy Systems) RESEARCH SCIENTIST with Thomas Pfeiffer and Philip Mewes Forchheim, Germany

Implemented algorithms for robotic navigation prototypes for image-guided spine surgery (*Matlab, KUKA KRL, Java*) 01/2018–04/2018

Optimized registration/segmentation techniques for robotic navigation in minimal invasive liver surgery (*Matlab, Python, C++*) 03/2016–05/2017

Pattern Recognition Lab, FAU Erlangen MASTER THESIS with Prof. Andreas Maier and Dr. Christian Riess Erlangen, Germany

Developed reconstruction algorithms (*in Java*) for reduction of beam hardening in phase-contrast X-ray tomography 04/2016–06/2017

Max-Planck Institute for Science of Light RESEARCH ASSISTANT with Prof. Gerd Häusler and Prof. Florian Willomitzer Erlangen, Germany

Investigated the physical and information theoretical limits of optical 3D sensing with structured light 07/2012–10/2015

Optimized camera and system calibration pipelines for multi-view 3D reconstruction, enhancing accuracy, robustness, and reducing cost

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 (<i>OpenCV, Kornia</i>), medical imaging (<i>segmentation, reconstruction</i>), 3D reconstruction and lightfields
Languages	German (<i>native</i>), English (<i>professional</i>), French (<i>conversational</i>), Spanish (<i>conversational</i>), Chinese (<i>basic use</i>)

Other Accomplishments

Teaching Experience Developed and taught 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 Mentored undergraduate and graduate students in research projects related to computer vision and machine learning

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. Cossairt 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