

Kevin Tandi

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RESEARCH INTERESTS

Computational Imaging, Lensless Cameras, Inverse Problems, Implicit Neural Representations, Signal Processing, Optics, Graphics

EDUCATION

University of California San Diego, Jacobs School of Engineering

M.S. in Electrical Engineering, Signal and Image Processing

Sept 2022-Sept 2024

Ph.D. in Electrical Engineering, Signal and Image Processing

Sept 2024-Present

La Jolla, CA

GPA: 3.66/4

University of Florida, Herbert Wertheim College of Engineering

B.S. in Computer Engineering, Physics minor

Davis United World College Scholar (Full Scholarship)

Aug 2018-Aug 2022

Gainesville, FL

GPA: 3.92/4

RESEARCH EXPERIENCE

Computational Imaging Systems Lab, University California, San Diego

Research Assistant, PI: Prof. Nicholas Antipa

La Jolla, CA

Sept 2022-Present

RnGCam: High-speed video from rolling global shutter measurements

- We fuse measurements from a synced global and rolling shutter-diffuser optical system using a Implicit Neural Representation to enable high-quality, high-speed video reconstructions with dense backgrounds.
- Our method separately models the static and dynamic scene components, while regularizing dynamics explicitly. In simulation, we show that our approach significantly outperforms previous RS compressive video methods, as well as state-of-the-art frame interpolators.
- Prototype recovers 230 frames of video at 4,800 frames per second for dense scenes, using hardware that costs $10\times$ less than previous compressive video systems.

High-speed neuroimaging with rolling shutter and diffusers.

- Implemented simulation platform to study inverse problem of recovering kilohertz frequency temporal neural traces from a single shot imaging system by exploiting signal sparsity and neuron activity factorization.
- Investigated noise and multiplexing effects of diffuser on inverse problem.
- Work presented on the 2024 Annual KIBM Symposium on Innovative Research.

Uncertainty quantification for 3D localization using Light Field camera

- Statistical analysis (modelling of noise in camera sensors, Fisher information) on the design of a light field camera for 3D localization in low light conditions.

Mitsubishi Electric Research Laboratories

Research Internship, Supervisor: Hassan Mansour

Boston, MA

Summer, 2025

- Neural reconstruction algorithms for Indoor Airflow Imaging Using Physics-Informed Schlieren Tomography

Computational Imaging Lab, EECS, University California, Berkeley

Research Internship, Supervisor: Prof. Laura Waller

Berkeley, CA

Summer, 2021

- Computational design of 3D differential phase contrast microscope
- Jointly optimized for illumination and pupil coding using TensorFlow based optimization framework
- Optimized phase masks and illumination patterns reduced reconstruction RMSE across wide range of numerical apertures
- Presented research talk in COSI 2022 and NSF sponsored STROBE Summer Undergraduate Research Scholar Symposium

SmartData Lab, ECE, University of Florida

Undergraduate Researcher, Supervisor: Prof. Joel B. Harley

Gainesville, FL

Neuromorphic cameras for structural health monitoring.

Fall, 2021 – Fall, 2022

- Using event based cameras for material modal analysis.
- Analyzing phase signals from event camera using principal component analysis

Elucidating Grain Growth in Ceramic Materials.

Fall, 2020 – Spring 2021

- Interdepartmental team using deep learning to model and understand material grain growth
- Developed code used to calculate grain curvature from grain images and process experimental data in Python

JainLab, CS, University of Florida

Gainesville, FL

Undergraduate Researcher, Supervisor: Prof. Eakta Jain

Spring, 2019 – Fall, 2020

- Florida Department of Transportation Schoolzone Project
- Assisted in the collection of eye-tracking data from drivers in school zones
- Developed pipeline to automate eye tracking annotation using eye-tracking data, OpenCV, and YOLO object detector

TEACHING EXPERIENCE

Department of Electrical and Computer Engineering, University of Florida

Gainesville, FL

Undergraduate Teaching Assistant, EEL3135 Signals and Systems

Spring, 2021

- Supervise and help students with coursework and labs
- Host weekly office hours for small groups of students
- Weekly meetings with other TAs, grade quizzes and homework

ACADEMIC AWARDS

Kavli Innovative Research Grant (2023): Support for research on novel high speed imaging system to record neural activity

UCSD ECE Departmental Fellowship (2022): First year graduate school fellowship

UF Computer Engineering award (2022): Highest award to ECE department graduating class

Davis United World College Scholar (2018 – 2022): 4 year full ride scholarship

STROBE Undergraduate Research Scholar (Summer 2021): NSF sponsored undergraduate research

UF University Scholars (2021): University-wide award to 200 students across majors per year

UF Emerging Scholars (2019)

College of Engineering Dean's List (2018 – 2021)

President's Honor Roll (Spring 2019, Fall 2020)

Indonesian Junior Team Lead, World Robot Olympiad: Doha, Qatar (2015)

Publications

Kevin Tandi, Xiang Dai, Chinmay Talegaonkar, Gal Mishne, and Nick Antipa. "RnGCam: High-Speed Video from Rolling Global Shutter Measurements." In Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV), 2025

Abstracts

Kevin Tandi, Ruiming Cao, Laura Waller, "3D refractive index imaging by optimized partially coherent light and pupil coding" in Computational Optical Sensing and Imaging, Optica (2022).

OTHER HARDWARE PROJECTS

Laser spirograph music visualizer *Design 1 project*

Fall, 2021

- Utilized SPI, UART, ADC, and various sensors to control spirograph patterns in response to music
- Designed and manufactured complete circuit on a PCB.

Digital Keyboard Piano *Microprocessor Applications final project*

Spring, 2021

- Interfaced computer keyboard with microprocessor and speaker.
- Utilized SPI, UART, ADC to build electronic piano with reverb, distortion, and other filters.

RELEVANT COURSEWORK

Digital Signal Processing, Fourier Optics, Parameter Estimation, Random Processes, Digital Image Processing, Linear Algebra, Computational Imaging, Microprocessor Applications, Intro to Computer Organization, Data Structures, Computational Photography, Digital Logic and Computer Systems, Circuits 2, Operating Systems, CAD Design

TOOLS

Python, C, MATLAB, Pytorch, Electronics prototyping, Microprocessors, Linux system programming, PCB design, Git

LANGUAGES

English, Indonesian, Mandarin, Hokkien