

MEL J. WHITE

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RESEARCH STATEMENT

My research in computational imaging incorporates unconventional sensors—both off-the-shelf and custom-designed—in order to overcome challenges in imaging for applications ranging from biomedical to defense, and diverse modalities, including holography, LiDAR, and wavefront sensing. Complementary projects on real-time data processing for edge devices aim to make these computational pipelines fast, efficient, and accurate.

ACADEMIC POSITIONS

Postdoctoral Associate , Washington, DC Naval Research Laboratory, Advanced Optical Concepts <i>Award from National Research Council</i>	2025-present
Postdoctoral Scholar , Houston, TX Rice University, Department of Electrical and Computer Engineering <i>Advised by Ashok Veeraraghavan and Rich Baraniuk</i>	2022-2025

EDUCATION

Cornell University , Ithaca, NY PhD, Electrical and Computer Engineering <i>Dissertation: CMOS Computational Camera Sensors for Imaging Through Scattering Media</i> <i>Advisor: Alyosha Molnar, Committee: Rick Johnson, Steve Adie</i>	2022
Cornell University , Ithaca, NY MS, Electrical and Computer Engineering <i>Concentration in Applied Mathematics</i>	2019
Rensselaer Polytechnic Institute , Troy, NY BS, Electrical and Computer Engineering	2014
The College of William and Mary , Williamsburg, VA BA with High Honors, International Relations, minor in Economics	

AWARDS AND HONORS

Junior Fellow of the Rice University Academy of Fellows	2022
Rising Stars in EECS	2022
National Science Foundation Graduate Research Fellowship	2015
Dean's Fellowship (Cornell)	2014
Tau Beta Pi (RPI)	2013

PUBLICATIONS

Babaei, H., **White, M.**, Alemohammad, S. and Baraniuk, R. “WaLRUS: Wavelets for long-range representation using SSMs,” in Advances in Neural Information Processing Systems (NeurIPS), vol. 38, 2025

Babaei, H., **White, M.**, Alemohammad, S. and Baraniuk, R. “SaFARi: state-space models for frame-agnostic representation”. Transactions on Machine Learning Research, 2025, iISSN: 2835-8856.

White, M., Zhang, T., Dave, A., Ghajari, S., Molnar, A., Veeraraghavan, A. “First-Arrival Differential Counting for SPAD Array Design”. Sensors 2023, 23, 9445.

White, M., Zhang, T., Dave, A., Ghajari, S., Molnar, A., Veeraraghavan, A. “FAD-SPADs: a New Paradigm for Designing Single-Photon Detecting Arrays”. International Image Sensors Workshop (IISW), May 22–25, 2023

Zhang, T., **White, M.**, Dave, A., Ghajari, S., Raghuram, A., Veeraraghavan, A., and Molnar, A. “First Arrival Differential LiDAR”, 2022 IEEE International Conference on Computational Photography (ICCP)

White, M., Ghajari, S., Zhang, T., Dave, A., Veeraraghavan, A., and Molnar, A. “A Differential SPAD Array Architecture in 0.18 μm CMOS for HDR Imaging”, International Conference on Circuits and Systems, May 28–June 1, 2022.

White, M., “An Interactive Activity on Optical Resolution”. American Society for Engineering Education Annual Conference & Exposition, July 26–29, 2021

White, M., Boominathan, V., Veeraraghavan, A., and Molnar, A. “On-Chip Optical and Analog Processing in 180nm CMOS for Holography”. 54th Asilomar Conference on Signals, Systems and Computers, November 1–4, 2020.

PATENTS

White, M., Provisional Patent Application Filed: 213350-US1, “A Pixel-Voting Method For Spot Tracking With Event Cameras”, 2026

INVITED TALKS

“Event-based Wavefront Sensing for Adaptive Optics”. *Workshop on Emerging Architectures for Sensing, Computing, and Control, Purdue University*, July 20-21, 2026

“State-Space Models for Imaging at the Edge”. *High-Performance Computing, Electronic Imaging, Burlingame, CA*, Feb. 4, 2025

“Catching a Wavelet: Rethinking State-Space Models for Imaging at the Edge”. *UCLA Grundfest Lecture Series*, Dec. 6, 2024

“Computational Image Sensors for Tiny Optics and Big Data”. *Frontiers in Optics, Tacoma, WA*, October 12, 2023

POSTER PRESENTATIONS

“Wavefront Reconstruction with Event-Based Sensors”. Mel White, Matt Ziemann, Divya Koganti, Harshil Dave. *International Conference on Computational Photography, Princeton, NJ*, July 13-15 2026.

WORKSHOPS, CONFERENCE SESSIONS, AND COMPETITIONS HOSTED

“Event Horizon: Pushing the Limits of Computational Imaging with Event Cameras”. With Matt Ziemann, Tony Allen. *Computational Imaging Symposium, Burlingame, CA*. Feb. 22-24, 2027

“Computer Vision with Single-Photon Cameras”. With Atul Ingle, Sotiris Nousias, Mian Wei, Sacha Jungerman, Mohit Gupta. *International Conference on Computer Vision (ICCV)*, Honolulu, HI, Oct. 19, 2025

“Single-Photon Challenge”. With Atul Ingle, Sotiris Nousias, Mian Wei, Sacha Jungerman, Mohit Gupta. <https://singlephotonchallenge.com/2025-2026>

“Multimodal Imaging”. *Computational Imaging XXIV*, Burlingame, CA, Mar. 2026

“Imaging at the Edge”. *Computational Imaging XXII*, Burlingame, CA, Feb. 2024

PROFESSIONAL SERVICE

International Conference on Computational Photography <i>Local Arrangements Chair</i>	2026-2027
Optica, <i>Paper reviewer</i>	2024-Present
Journal of Solid-State Circuits, <i>Paper reviewer</i>	2024-Present
Rice ECE DEI Committee, <i>Member and postdoc representative</i>	2023-2024
ECE Graduate Women and Gender Minorities Organization, <i>Co-founder and co-chair</i>	2023-2024
ECE Graduate Organization (ECE-GO), <i>Chair and event organizer</i>	2017-2021

STUDENTS SUPERVISED

Atsutse Kludze	Cornell, 2018-2019
– <i>Project: Monte-Carlo simulations of photon scattering for sensor design</i>	
– Currently a PhD candidate at Princeton University	
Desiree Gutierrez	Rice, 2023
– <i>Project: Prototype design and fabrication for biosensing</i>	
– Currently an undergraduate at Texas A&M	
Rachel Gu	Rice, 2023-2024
– <i>Project: Embedded programming for biosensing hardware</i>	
– Alumna of Rice University, recipient of Excellence in Undergraduate Research award	

TEACHING AND OUTREACH

Organizer and Teacher Trainer	Summer 2020, 2021
REACT Program	Cornell University
– Organized and recruited teachers and grad students for a two-day workshop at Cornell to translate research into K-12 classrooms	
– Gave technical talks and developed resources for classroom activities under framework to grant NYS continuing education credits	
High School Outreach Educator	Spring 2020
GRASSHOPR Fellow Program	Cornell University
– Created and delivered two 1.5 hour lessons for 12th-grade Physics students on optics and computational imaging	
Teaching Assistant	2018-2019
Analog Integrated Circuit Design, Signals and Systems	Cornell University
– Ran weekly labs for undergraduate and graduate students on MATLAB and Cadence/Virtuoso	
– Developed assignments and solutions, and graded course assignments and exams	
Mathematics Instructor	Fall 2018
Cornell Prison Education Program	Five Points Correctional Facility
– Co-taught a weekly math course for incarcerated men designed to bridge the gap between GED/high school math and college-level math required for an associate’s degree	

TOOLS AND SKILLS

Programming	Git, Python [numpy, scipy, matplotlib, pywavelet, pytorch, jupyter], MATLAB [Data Acquisition, Computer Vision, Image Acquisition, Image Processing, Optimization, Control Systems, Simulink, App Designer]
Circuit Design	Altium, KiCAD, Cadence, Virtuoso
Clean Room	Wire bonding, dicing
Hardware and Test	Manual and reflow soldering, National Instruments DAQs
Presentation	L ^A T _E X, TikZ, Adobe Illustrator