Evan Widloski

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Focus

I am pursuing a PhD under Farzad Kamalabadi and co-advised by Lara Waldrop with a focus on inverse problems in the context of remote sensing. I'm interested in applying machine learning and signal processing techniques on inverse problems in the context of remote sensing.

Education

University of Illinois Urbana-Champaign

PhD Electrical Engineering - Atmospheric remote sensing, inverse problems, machine learning, tomography. Advised by Lara Waldrop and Farzad Kamalabadi. GPA: 3.6 — 2021-present

MS Electrical Engineering - DSP and remote sensing, computational optics. Advised by Farzad Kamalabadi. — 2018-2020

Purdue University

BSEE Electrical Engineering, BS Mathematics. GPA 3.6 — 2013-2017

Research Experience

NASA Carruthers Geocoronal Observatory (CGO) - UIUC research assistant (link)

Used machine learning and classical signal processing techniques to develop tomography algorithms for reconstructing 3D Hydrogen densities in Earth's exosphere to be used on Carruthers Space Telescope. — 2022-present

NASA Milli-Arcsecond Imaging with Smallsat Enabled Super Resolution (MAS) - UIUC research assistant

Built computational framework for simulating diffractive hyperspectral optical system and deblurring/ denoising measurements. — 2018-2020

NASA VIrtual Super Resolution Optics with Reconfigurable Swarm (VISORS) - UIUC research assistant

Developed registration algorithm for aligning smallsat science images under spacecraft drift and extreme noise. (link) — 2019-2022

Laboratory for Advanced Space Systems at Illinois (LASSI)

Built IV curve tracer for characterizing experimental photovoltaics in space. To be deployed on International Space Station in late 2023. (link) — 2021-present

Selected Publications

Tomosphero - Differentiable Projector for Tomography in Spherical Coordinates - ApJ (in review) 2025
Development of an Innovative Payload Interface Board for CubeSats - SmallSat (link) 2023
Low SNR Multiframe Registration for Cubesats - IEEE ICIP (link) 2022
Optimal Measurement Configuration in Computational Diffractive Imaging - IEEE ICIP (link) 2020
Low-Complexity System and Algorithm for an Emergency Ventilator Sensor and Alarm - IEEE BioCAS (link) 2020

Technical Skills

Technical

Data Science - PyTorch, NumPy, SciPy and friends.
PCB Design - Proficient. KiCAD for designing space-rated systems.
Other - Git, Linux systems administration, C, Go, Solidworks, Matlab, Latex

Research

Remote Sensing - Using machine learning and classical iterative techniques on inverse problems.
Fourier Optics - Simulating diffractive optical systems. Spectral Imaging.

Selected Classwork

ECE558 - Digital Imaging
ECE598ID - Inverse Problems and Learning
ECE549 - Computer Vision
ATMS411 - Satellite Remote Sensing (audited)
ECE551 - Digital Signal Processing 2
ECE513 - Vectorspace Linear Algebra
ECE534 - Random Processes
ECE463 - Digital Communications Lab
ECE561 - Detection and Estimation
MA514 - Numerical Analysis (Purdue)
ECE438 - Signal Processing and Systems (Purdue)
ECE407 - Cryptography

Extracurricular

UIUC RapidVent/RapidAlarm Ventilator Team - electrical lead

Designed low-cost electronic ventilator monitor that monitors airway pressure and breathing rate and alerts staff when a problem with ventilation occurs. (link) 2016-2017

Purdue Orbital Team - electrical lead

Designed mesh node for high altitude balloons with custom APRS modem based on ATMega328. (link) 2016-2017

Purdue IEEE ROV Team - electrical lead

Designed compact, addressable motor controller for submersible vehicle. Build powerline transmission capable of delivering 2 NTSC video feeds with bidirectional data stream for vehicle telemetry. (link) 2013-2015

Purdue Linux Users Group - president

Organized meetings and lectured on topics such as Python, regular expressions, init systems, Buildroot, networking. 2013-2017

Previous Work Experience

UIUC Senior Design - teaching assistant

Technical advisor for senior level capstone design course 2018-2020

Spooky Action Robotics - cofounder

Designed high power 5kW tether system for multicopter capable of multi-day flight 2016-2018, 2020

Texas Instruments - field applications engineer 2016

Qualcomm - software engineer

Developed API shim for emulating mobile biometric hardware 2015

Presentations

mDNS and Zeroconf - UIUC Linux Users Group 2024
A Tour of KiCAD - UIUC Senior Design 2020
Introduction to Postscript (the printer language) - UIUC Linux Users Group 2019
Electrical Series - Board Layouts in Eagle - Purdue EPCS202 2017
Electrical Series - Schematics in Eagle - Purdue EPCS202 2017
Becoming a Vim Power User - Purdue Linux Users Group 2016
Git Version Control - Purdue Linux Users Group 2015
Grokking Bash - Purdue Linux Users Group 2015
Regular Expressions Primer - Purdue Linux Users Group 2014
Linux File Permissions - Purdue Linux Users Group 2014

Achievements and Awards

Purdue University Dean's List 2015, 2016, 2017
Rappaport Wireless Communication Scholarship 2016
RCA Zworykin Scholarship 2014