Robert Raynor

PhD Student · Electrical and Computer Engineering

University of Washington, 1410 NE Campus Parkway, Seattle, WA 98195

rraynor@uw.edu | www.rayncloud.com

Education

University of Washington *Seattle, WA*

PhD Electrical and Computer Engineering *2019 - present*

- Advisor: Dr. Sreeram Kannan

Air Force Institute of Technology *Dayton, OH*

MS Applied Physics *2012 - 2014*

- Thesis: "Range Finding with a Plenoptic Camera"

US Air Force Academy *Colorado Springs, CO*

BS Physics *2008 - 2012*

- Minor in Japanese

Professional Experience

Owl Autonomous Imaging *Rome, NY*

Consultant *2019*

- Modeling, algorithm development, and various consulting for passive ranging system using plenoptic cameras.

United States Air Force Academy - Physics Department *Colorado Springs, CO*

Physics Instructor *2017 - 2019*

- Instructed / course-directed courses in classical mechanics and electricity & magnetism.
- Investigated use of convolutional neural networks for direct inversion of optical distortion due to atmospheric turbulence.

Air Force Research Lab - Directed Energy Directorate - Laser Technologies *Albuquerque, NM*

Beam Control Team Lead *2016-2017*

- Built computationally efficient simulation framework for analyzing speckle in partially coherent active illumination.
- Used simulation capability to demonstrate speckle mitigation in active imaging scenario via homogenizing light pipe.

Air Force Research Lab - Directed Energy Directorate - Laser Effects *Albuquerque, NM*

Laser Vulnerability Physicist *2014-2016*

- Led modeling, simulation, and testing effort to validate laser power density measurement plate for DARPA $12M field test.
- Implemented calibrated photogrammetry via computer-vision techniques, and devised novel image processing algorithms to enable ground-breaking test of laser effectiveness against dynamic targets.

Publications

Published

Raynor, R. A., Spencer, M. F., Moore, T. D. (2017). Modeling coherence propagation in a homogenizing light pipe for speckle mitigation. In *Unconventional and Indirect Imaging, Image Reconstruction, and Wavefront Sensing 2017* (Vol. 10410, p. 104100X). International Society for Optics and Photonics.

Spencer, M. F., **Raynor, R. A.**, Banet, M. T., Marker, D. K. (2016). Deep-turbulence wavefront sensing using digital-holographic detection in the off-axis image plane recording geometry. *Optical Engineering*, 56(3), 031213.

Moore, T. D., **Raynor, R. A.**, Spencer, M. F., Schmidt, J. D. (2016). Waveguide generated mitigation of speckle and scintillation on an actively illuminated target. In *Unconventional Imaging and Wavefront Sensing XII* (Vol. 9982, p. 99820E). International Society for Optics and Photonics

Spencer, M. F., **Raynor, R. A.**, Rhoadarmer, T. A., Marker, D. K. (2016). Deep-turbulence simulation in a scaled-laboratory environment using five phase-only spatial light modulators. In *Proc. 18th Coherent Laser Radar Conf.*

Banet, M. T., Spencer, M. F., **Raynor, R. A.**, Marker, D. K. (2016). Digital holography wavefront sensing in the pupil-plane recording geometry for distributed-volume atmospheric aberrations. In *Unconventional Imaging and Wavefront Sensing XII* (Vol. 9982, p. 998208). International Society for Optics and Photonics.

Raynor, R. A. (2014). Range Finding with a Plenoptic Camera (No. AFIT-ENP-14-M-29). MS Thesis. Air Force Institute of Technology.

Raynor, R. A., Walli, K. (2013, October). Plenoptic camera range finding. In *Applied Imagery Pattern Recognition Workshop (AIPR): Sensing for Control and Augmentation*, 2013 IEEE (pp. 1-11). IEEE.

In Review

Raynor, R. A., Kannan, S. (2021). Data Market as a Two-Sided Combinatorial Auction: Efficiency and Truthfulness in the large. In *The Twenty-Second ACM Conference on Economics and Computation*.

Relan, N., **Raynor, R. A.**, Li, S., Kannan, S., (2021). DeepPrivate: Scalable Distributed DNN Training with Data and Model Privacy. In *International Conference on Machine Learning*.

Teaching Experience

Sp 2020	**Probability Models and Inference**, Teaching Assistant
Wi 2020	**Advanced Technical Writing**, Teaching Assistant
Fa 2019	**Discrete Time Linear Systems**, Teaching Assistant
Su,Fa 2018	**Intro to Electricity and Magnetism**, Course Director, Instructor
Sp 2019 Sp 2018 Fa 2017	**Intro to Classical Mechanics**, Instructor

Awards

2018	**Course Director for Team of the Quarter** , Physics Department - U.S. Air Force Academy
2017	**Company Grade Officer of the Quarter**, Physics Department - U.S. Air Force Academy
2015	**Company Grade Officer of the Quarter**, Air Force Research Laboratory - Directed Energy Directorate
2014	**Distinguished Graduate**, Air Force Institute of Technology
2012	**Squier Award for Top Cadet in Physics**, Military Order of Foreign Wars of the United States **Top Cadet in Japanese**, United States Air Force Academy **Distinguished Graduate**, United States Air Force Academy

Professional Development

Professional Memberships

Tau Beta Pi Honor Society
OSA – Optical Society of America
SPIE – The International Society for Optical Engineering