# Aaron J. Pung, Ph.D.
## Data Scientist & ML Researcher

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I am a data scientist with 10+ years of experience in software development, AI/ML, and data analytics. My expertise in complex problem solving has been recognized through international awards, R&D100 Awards, and high-impact peer-reviewed publications. My passion to innovate and solve real-world problems is evidenced by numerous sole-author patents.

## Experience

**Sr. Data Scientist (Signal Processing)** – 10/2022 to Present
**Slingshot Aerospace**, Remote
- Developed end-to-end low-latency machine learning (ML) solutions to predict fog presence based on large weather datasets, achieving 93% precision
- Created a supervised ML-enhanced analysis tool to predict location-specific sensor metrics, resulting in a 30% increase in collection volume and enhanced system safety
- Independently constructed a digital twin of the electromagnetic environment for air-, land-, sea-, and space-based assets, expanding Slingshot's expertise into the RF domain and beyond
- Developed and validated satellite communication signal constructors using Fibonacci and Galois algorithms, resulting in a 300% increase in detectable and decodable signals
- Developed, automated, and maintained containerized tools to pull, process, and utilize real time satellite data from AWS, reducing overall pipeline runtime by 250%

**Sr. Data Scientist (RF Analysis)** – 09/2020 to 10/2022
**Space Dynamics Laboratory**, Albuquerque, NM
- Independently developed a data-agnostic multi-purpose tool suite for RADAR signal analysis in Julia, providing real-time characterization and classification of passively collected signals
- Automated large-scale campaign data analysis combining water-, air-, and ground-based RF and optical systems, drastically reducing the data-to-document time window
- Developed an automated routine to remotely evaluate and monitor RADAR systems, increasing overall efficiency by 300%

**Computer Scientist / Image analyst** – 01/2015 to 08/2020
**Sandia National Laboratories**, Albuquerque, NM
- Led modeling efforts to design and characterize electro-optic infrared sensors, resulting in a 2019 R&D100 Award for Nanoantenna-Enabled Detectors (NEDs)
- Developed remote sensing analysis tools for gathering and processing data from plenoptic, multispectral, and hyperspectral satellite imaging systems
- Created hyperspectral image processing algorithms to ingest and interpret time-series plant health data, providing an early-warning system for harmful gas detection
- Assessed and improved sub-pixel target tracking algorithms, increasing performance for on-orbit and ground-based detection systems

# Patents

U.S. Patent US20230176261A1, "Uniaxial Optical Multi-Measurement Imaging System", Oct. 26, 2022
U.S. Patent US20230179843A1, "Aperture Stop Exploitation Camera," Sept. 28, 2022.
U.S. Patent US20230175952A1, "Uniaxial Optical Multi-Measurement Sensor," Dec. 2, 2021.
U.S. Patent 11761750, "Multi-environment Rayleigh Interferometer," Sep. 19, 2023
U.S. Patent 16369218, "Optical Devices Enabled by Vertical Dielectric Mie Resonators," May 5, 2021.

# Publications (Journal)

**Aaron J. Pung,** "Computational analysis of a scalable optically homogeneous free-space interferometer," J. Opt. Soc. Am. A 40, 1789-1796 (2023)

**Aaron J. Pung,** "Capturing multiple full-scene images with a single camera via aperture stop exploitation," J. Opt. Soc. Am. A 39, 1456-1461 (2022)

S. Campione, **A. J. Pung**, L. K. Warne, W. L. Langston, T. Mei, and H. G. Hudson, "Validation of Shielded Cable Modeling in Xyce Based on Transmission-Line Theory," Progress In Electromagnetics Research Letters, Vol. 87, 51-57 (2019)

Goldflam, Michael, et al. "Nanoantenna-Enhanced Resonant Detectors for Improved Infrared Detector Performance". United States, 2020.

Campione, Salvatore, et al. "Validation of Shielded Cable Modeling in Xyce Based on Transmission-Line Theory." *Progress In Electromagnetics Research Letters*, vol. 87, 2019, pp. 51–57.

(Full list available on website)

# Education

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| Doctorate of Philosophy: | Photonic Science | Clemson University | 2013 |
| Master of Science: | Optical Engineering | Univ. of North Carolina | 2011 |
| Bachelor of Science: | Physics | Kansas State University | 2008 |

# Awards

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| UK Science and Technology Cooperation Award (Project Team, Space Dynamics Lab) | 2024 |
| Employee Recognition Award (Sandia National Laboratories) | 2020 |
| R&D100 Award | 2019 |