

Spencer Alexander

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[LinkedIn](#) • [GitHub](#) • [Portfolio](#)

Seattle, WA

Systems Engineering | Physical Modeling | Product Strategy

Versatile technical professional with 14 years experience spanning scientific research, computational modeling, engineering, and product development across semiconductor metrology, cloud infrastructure, optics, and advanced R&D.

2 MS Degrees in Physics, 3 professional certificates in AI and ML, 2 patents in ML and product development, 1 Nature publication in diffractive optics, 4 company accolades for data workflow leadership and high-impact product contributions.

Proven track record of applying physics-based modeling, scientific computing, and machine learning to complex real-world systems. Experienced in developing data-driven solutions spanning optics, semiconductors, metrology, and cloud-scale infrastructure. Adept at transforming experimental and operational data into actionable insights, optimizing algorithms for robust system performance, and driving technical initiatives from concept to deployment and productization. Accomplished in collaborating across engineering, research, and product teams to align technical development with customer needs.

Areas of expertise include:

Physics-Based Modeling | Systems Engineering | Scientific Computing | Optics & Photonics | Semiconductor Metrology | Machine Learning | AI Model & Product Development | Statistical Modelling & Inference | Signal & Image Processing | Technical Testing & Automation | Cloud & HPC Computing | Software Development & Review | Product Management | Product Roadmap Development & Execution | Product Feature Specification & Oversight | Cross-functional Technical Leadership

Career Experience

Microsoft, Redmond, WA

2024 – 2026

Technical Product Manager – AI & Cloud Computing

Led end-to-end development and deployment of AI-driven outage detection and triage products within Azure's AIOps organization, under the Brain team. Partnered with data scientists and engineers to design, train, validate, and operationalize models that detect service incidents, classify their severity, and route alerts to the correct service owners before customer impact. Coordinated with UX PMs to align user experience across Brain and ensure scalable, reliable, and user-friendly workflows for on-call engineer use. Drove platform readiness for efficient model training, retraining, and large-scale deployment, while evangelizing AI literacy across AIOps teams.

Key Accomplishments:

- Reduced time to detection of Brain-detected Azure outages by 10% through delivery of precision-recall-optimized outage detection models trained on service level indicator (SLI) data.
- Launched new generation of multimodal detection models incorporating non-SLI signals, improving outage identification recall by 10% without significant loss of precision, and establishing groundwork for Brain as Azure's central cross-signal hub for future AI-centric outage detection with minimal user configuration burden.
- Founded and facilitated the "AIOps AI Learning Series," a recurring cross-disciplinary forum where engineers and PMs shared methods, frameworks, and best practices in applied AI, strengthening team fluency and alignment with the evolving AI ecosystem.

ASML, Hillsboro, OR

2018 – 2023

Data Scientist and Product Manager

Led development and customer deployment of data-driven solutions for advanced semiconductor metrology systems. Developed AI/ML models, statistical methodologies, scientific software, and visualization tools to analyze process variation, imaging behavior, overlay performance, and measurement system limitations in high-volume chip manufacturing environments. Worked closely with customers and cross-functional engineering teams to translate complex manufacturing and instrumentation challenges into deployable technical and product solutions.

Key Accomplishments:

- Drove customer adoption of product suite valued at over \$300M by successfully landing software applications critical to customer success and demonstrating their benefits when used with multiple ASML products in combination.
- Attracted over \$30M in customer investments by designing software for predicting misalignment between computer chip layers. Product achieved 50x resolution improvement, exceeding established high-throughput measurement limits.
- Attained 10% anomaly detection increase and 5% noise reduction in regressive models used by Intel statistical process control engine software by incorporating process issue root-cause predictors.
- Accomplished yearly benefit opportunity of \$15M by developing dashboard and automated data retrieval/analysis software for extraction, modelling, and visualization of machine data for failure prediction.
- Improved accessibility and scalability of key pathfinding initiative by migrating metrology big data workflows from local systems to cloud platforms, including Azure and ASML-owned HPC.
- Empowered team with valuable skills by establishing 10-course sequence focused on scripting and advanced data analysis, now integral part of engineer training library.
- Led successful acquisition of metrology patent by creating predictive regression- and neural network-based models to predict scanning electron microscope measurements based on optical data.

University of Oregon, Eugene, OR

2013 – 2018

Graduate Researcher

Enabled angular momentum-based phase and magnetic imaging, as well as advanced electron microscope capabilities, by enhancing creation of x-ray and electron beams. Used wave mechanics and Fourier analysis to simulate behavior of optical components, laying foundation for noteworthy publication in Nature Photonics.

Key Accomplishments:

- Optimized data analysis and research processes by coding Python repositories for image processing, physical modeling, and instrumentation control.
- Engineered microwave antennae for generation of oscillating magnetic fields through application of computational tools, such as Mathematica and COMSOL, and theoretical knowledge in circuit and transmission line theory.
- Pioneered method for acoustic wave production by engineering solid state diode and leveraging interaction of phonons with host material through light assistance.

Voxtel Inc., Eugene, OR

2011 – 2013

Researcher

Advanced light detection technology by driving development of quantum dot-based photodetector devices. Acquired photonics patent to facilitate imaging technology R&D by researching quantum dot applications in Si-based IR and x-ray light detectors.

Key Accomplishments:

- IP generation: Successfully acquired patent by devising methodology to safeguard quantum dots from degradation.
- Lab software modernization: Enhanced efficiency of company laboratory by implementing software-based coordination system for instrumentation and replacing previous ad-hoc approaches.

Education

M.S. Physics, from Ph.D. Program | Focus: Diffractive Optics, On-chip Photonics, University of Oregon, Eugene, OR, 2018

M.S. Applied Physics | Focus: Semiconductors & Photovoltaics, University of Oregon, Eugene, OR, 2012

B.S. Chemistry | Research: Energy Storage Devices, University of Texas, Austin, TX, 2010

Awards & Accolades

- Professional certificates: [Caltech AI and ML Bootcamp](#), [DL.AI TensorFlow Developer](#), [IBM Data Science](#)
- Patents: [Machine learning for synergistic metrology](#), [Quantum dots for photodetectors](#)
- Papers: [Nature Photon 13, 205–209 \(2019\) – LG and HG soft x-ray states generated using diffractive optics](#)
- Awards: [2022 Sharktank winner for new data analytics](#), 2021 Sharktank winner for ML imaging workflows, 2020 P2P award for outstanding collaborative achievements, 2019 P2P award for high-impact products

Independent Technical Projects

- Developed and deployed multiple independent software applications through [WebCraft Developers](#), including collaborative platforms, scientific exploration tools, and consumer-facing products.