

Imran Khan

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Professional Summary

Ph.D. physicist specializing in Optics | Computational Modeling | Imaging Systems, with 4 years of industry experience in CD-SEM metrology at Intel and additional research experience in experimental optics, modeling, and algorithm development. Strong background in physics-driven algorithm development, AI-enabled imaging workflows, and large-scale data analysis. Skilled in designing Python pipelines for automation, image quality assessment, and SEM tool health monitoring. Seeking roles at the intersection of optics, metrology, imaging, and AI-driven analysis.

Technical Skills

Programming & AI: Python, PyTorch, OpenCV, NumPy, pandas, Matplotlib, scikit-learn, SQL, Git, Jupyter
Modeling & Data Analysis: Statistical Process Control (SPC), Dashboarding, Statistical Modeling, MATLAB, COMSOL
Metrology & Imaging: CD-SEM, SEM, Optical Microscopy, TRPL, Image Quality Metrics (CNR, Sharpness, FFT, GLCM)

Experience

- SEM Metrology Engineer – Intel Corporation, Hillsboro, OR (Nov 2021 – Aug 2025)
- Primary tool owner for four CD-SEM systems; co-owner of four additional tools.
- Maintained SPC charts for measurement stability and drift detection.
- Designed Python dashboards for monitoring CD-SEM tool health (beam parameters and subsystem trends).
- Automated DCCD round-robin analysis for tool-to-tool matching.
- Built SEM image quality scoring toolkit (sharpness, CNR, FFT-sharpness, GLCM).

Education

Ph.D., Physics (Optics | Computational Modeling) – University of California, Merced (2016–2021)

M.S., Physics – Binghamton University (SUNY), 2016

Research Experience (PhD Projects)

Led Computational modeling, nano-fabrication, SEM characterization, and optical scattering measurements.

- Modeling and Experimental Verification:
 - Developed a full-wave computational model combining multiple-scattering physics and diffraction theory to analyze 3D plasmonic nanostructures.
 - Fabricated designed metastructures and correlated SEM characterization + optical scattering measurements with simulated predictions.
- Optical Metrology for Energy Transfer in Nanoclusters
 - Characterized nanoscale energy transfer (NSET/FRET) dynamics using Time-Resolved Photoluminescence (TRPL) spectroscopy.

Selected Projects (AI & Imaging)

- SEM Image Quality Toolkit: Python-based scoring using sharpness, CNR, FFT, GLCM.
- California Housing Regression Pipeline: End-to-end ML workflow for prediction.
- Chest X-ray Classification: PCA+SVM and CNN-based models for pneumonia detection.

Selected Publications

Khan, M. I., et al., "Scattering by nanoplasmonic mesoscale assemblies," JOSA A, 2025.

Khan, M. I., et al., "Modeling broadband cloaking using 3D nano-assembled plasmonic meta-structures," Optics Express, 2020.