Daksh Kumar Singh

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Research Statement

A Purdue University undergraduate student who's research aims to optimize nanofabrication and characterization techniques through the integration of machine learning with quantum optics, plasmonics, and optical metamaterials. Focus is on studying the effect of topological variations of metamaterials and discovering novel applications for optical and physical properties of solid-state materials. Aims to contribute to a variety of applications, including integrated photonic circuits, quantum sensing, and quantum computing by developing high-efficiency, reconfigurable, semiconductor-compatible devices.

Education

Purdue University *West Lafayette, Indiana*

Bachelor of Science in Electrical Engineering *Aug 2022 - Current*

- John Martinson Honors College
- Quantum Science Center
- **Courses:** Multivariate Calculus, Python for Data Science, Electric and Magnetic Interactions, Electrical Engineering Fundamentals I

Work Experience

Summer Undergraduate Research Fellowship *West Lafayette, Indiana*

Purdue University *May 2023 - Aug 2023*

- Selected for SURF at Purdue University to work on 'Machine Learning Assisted Plasmonic Fabrication'
- Awarded fellowship to work at research lab in Birck Nanotechnology Center, Purdue University

Undergraduate Researcher *West Lafayette, Indiana*

Purdue University *Jan 2023 - Apr 2023*

- Worked in nanofabrication and characterization
- Learnt machine learning models to analyze quantitative data

Publications

Conference Proceedings

Physical Verification of Unclonable Spectral Tags in Microelectronics Packaging
Daksh Kumar Singh, Yuheng Chen, Blake Anthony Wilson, Alexandra Boltasseva, Alexander Kildishev, Vladimir Shalaev
Spring 2023, West Lafayette, Indiana

Achievements

Apr 2023 **First-Time Researcher Award**, Engineering Undergraduate Research Office (EURO) *Purdue University*

Dec 2022 **Dean's List**, College of Engineering *Purdue University*

Dec 2022 **Semester Honors**, College of Engineering *Purdue University*

Skills

Fabrication E-Beam Lithography, Etching, Photoresist Spin Coating, Cleanroom Certification (ISO Class 3-4-5-6).

Characterization Variable Angle Spectroscopic Ellipsometry, Dark Field Microscopy, Scanning Electron Microscopy.

Certifications Laser Safety Certified, Cleanroom Certified (Class 1-10-100-1000).

Programming MatLab, Python (PyTorch, NumPy), C/C++.

Soft Skills Communication, Documentation, Leadership, Time Management, Teamwork, Problem-Solving.

Languages

English Professional proficiency

Hindi Native proficiency