THARINDU DAMESHA RAJAPAKSHA

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Professional Summary

PhD Candidate in Physics specializing in semiconductor devices and photonic nanostructures.
Over 4 years of hands-on cleanroom and nanofabrication experience with strong expertise in graphene-based devices, diffractive optics, and optoelectronic characterization. Collaborative researcher with publications in high-impact journals and experience working with NASA and interdisciplinary teams.

Education

PhD in Physics, Virginia Polytechnic Institute and State University, Blacksburg, VA | 2021–Present

Master's in Physics, Virginia Polytechnic Institute and State University, Blacksburg, VA | 2021–2024

B.Sc. (Honors) in Physics, University of Peradeniya, Sri Lanka | 2016–2020

Experience

Graduate Research Assistant, Virginia Tech | 2021–Present

- Fabricated hybrid graphene–Si and graphene–GaAs phototransistors for mid-IR detection.
- Over 4 years of cleanroom experience: PVD, ALD, RIE, photolithography, wet etching, and device dicing.
- Conducted advanced characterization: SEM, AFM, FTIR, pump-probe spectroscopy, Keithley SMUs, and lock-in amplifiers.
- Designed diffractive optical devices (FZPs, photon sieves, metalenses) using Lumerical, achieving publication in Advanced Optical Materials.
- Collaborated with NASA Langley Research Center on photonic device development.

Teaching Assistant, University of Peradeniya | 2020–2021

- Conducted undergraduate laboratory classes, mentoring students in experimental physics.
- Designed and improved lab experiments to enhance student engagement and outcomes.

Undergraduate Researcher, University of Peradeniya | 2018–2020

- Developed iron oxide thin-film gas sensors with enhanced sensitivity using dopants.
- Performed thin-film deposition and I–V characterization.
- Integrated fabricated films into functional gas sensors using Arduino.

Technical Skills

Fabrication: PVD, ALD, RIE, Photolithography, E-beam lithography, Wet Etching, Device Dicing
Characterization: SEM, AFM, FTIR, Pump-Probe Spectroscopy, Lock-in Amplifiers, Keithley SMUs
Simulation & Software: Lumerical, Meep, Python, OriginLab, KLayout, Blender 3D, MATLAB

Selected Publications

1. Howe, L., Rajapaksha, T. D., et al. (2024). High-Efficiency Multilevel Phase Lenses with Nanostructures on Polyimide Membranes. Advanced Optical Materials, 12(25), 2400847.

2. Rajapaksha, R. M. T. D., et al. (2021). Enhancement of gas sensitivity of ferric oxide thin films by adding activated carbon nanoparticles. Icon. Res. Eng. J., 4, 107-13.

3. Rajapaksha, R. M. T. D., et al. (2021). Improvement of gas sensitivity of ferric oxide thin films by adding Mn nanoparticles. Bull Mater Sci 44, 182.

Presentations & Workshops

- Oral Presentation: Fabrication of nanostructures for Diffractive optical elements, APS March Meeting 2024
- Poster Presentation: Diffractive optical elements on fused silica glass, Virginia Tech Soft Matter Symposium 2024
- Oral Presentation: Gas Sensitivity of Iron Oxide Thin Films, University of Peradeniya
- Oral Presentation: LED Display, University of Peradeniya

Collaborations

Graduate Research Collaboration with Dr. John Lecky, NASA Langley Research Center

PhD Advisor: Prof. Vinh Nguyen, Virginia Tech