Nishant Mishra

R&D Engineer – Nanofabrication & Process Optimization
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Professional Summary

R&D engineer specializing in nanofabrication and process optimization. Expertise in cleanroom operations, workflow automation (XRD and sputter), and SOP standardization. Proven track record in reducing cycle times and training teams. Seeking a process development role in nanotechnology to enhance scalability, quality, and throughput.

Technical & Core Skills

Nanofabrication & Cleanroom: Mask and Process flow design, Mask/Maskless Lithography, RF Magnetron Sputtering, PECVD, Wet Etch, RIE, DRIE, Vapor Phase Etch
Process Automation & Workflow Optimization: XRD & sputter automation, remote access, scripting, root-cause analysis, cycle-time reduction
Characterization & Metrology: XRD, AFM, DBLI, White Light Interferometry, Electrical characterization (DC I–V, Hall, 4-point probe, EIS, chronoamperometry, ferroelectric testing)
Design & Development: Equipment commissioning, upgrades & maintenance, 3D modeling & printing
Safety & Operations: Lead-safety, SOPs, & training, internal sample traceability, inventory, supplier management, handling of gases
Software Python, MATLAB, C++

Professional Experience

University of Twente – XUV Optics Group

Research Engineer – Thin Film & Process Development (Jul 2023 – Present)

- Reduced cleanroom cycle time by 75% (from two half-days with overnight hold to half a day) by eliminating redundant steps.
- Authored & maintained 7 SOPs (sputtering, cleanroom processes, XRD, AFM, DBLI & I–V stress testing) to standardize training and reduce variability.
- Implemented sample transfer logbook ensuring traceability; achieved zero lost samples in 12 months.
- Trained & advised 8 researchers in sputtering, XRD, cleanroom processing, and mask design, accelerating onboarding.
- Automated XRD workflow: reduced operator time from 60 minutes to 10 minutes; improved signal-to-noise via program automation and optimization.
- Upgraded & automated sputtering system for remote, controlled operation (gas flows, shutters, pump-down, temperature ramps, magnetron power).
- Managed inventory & supplier orders; accelerated commissioning of upgrades in collaboration with external suppliers and internal technical teams.
- Introduced lead-safety measures following safety review.
- Maintained 3D printer with zero downtime, 3D printed lab organizers to improve efficiency.

ECsens (now OccamDx)

Research Intern – Nanostructure Devices (Jul 2020 – Dec 2020)

- Designed semiconductor masks and performed electrochemical experiments for biosensor development.

CARE, IIT-Delhi

Research Intern – Biomemristor Fabrication & Biosensors (Jun 2017 – Sept 2019)

- Developed biomemristor devices for neuromorphic applications.
- Conducted electrical characterization of bio-FETs and memristive devices; analyzed impedance spectroscopy data.

Twente Pathway College

Teacher – Physics | *Module Coordinator – Computer Science & Project courses (Sep 2021 – Jun 2023)*

- Coordinated and delivered modules for 100–150 students; supervised projects and assessments.
- Strengthened communication and stakeholder engagement across diverse, international cohorts.

Education

M.Sc. Electrical Engineering – University of Twente, Enschede (2019–2021)
Specialization: Lab-on-Chip Systems | Research Honours Track
Master's thesis: Microvalve design for sub-millisecond gas transport to enable microsecond IR spectroscopy in photoelectrochemical CO_2 reduction; *Mechanism survey, device design & simulation, single-mask multi-depth cleanroom fabrication, heat-flow modeling, and control scheme*. [Link]

B.Tech. Electrical & Electronics Engineering – GGSIPU, Delhi (2014–2018)

Certifications & Training

- Basics and Design Principles for Ultra-Clean Vacuum
- Short Course: Reactive Magnetron Sputter Deposition
- Software Carpentry Workshop: Git & Version Control
- Secure Handling of Gases – University of Twente
- Lean Green Belt *(in progress)*
- Alarm and Firefighting – University of Twente *(in progress)*
- MOOC:Process Improvement and Optimization*(in progress)*

Selected Publications

- Vancomycin functionalized WO_3 thin film-based impedance sensor for selective detection of Gram-positive bacteria. *Biosensors and Bioelectronics*, 2019. [Link]
- MoS_2/TiO_2 hybrid nanostructure-based FET for rapid detection of Gram-positive bacteria. *Advanced Materials Technologies*, 2019. [Link]