VARAD PRAMOD LAD

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EDUCATION

Master of Science in Mechanical Engineering **Graduating May 2024**
Arizona State University, Tempe, Arizona
Relevant Coursework: Semiconductor Fabrication 101, Modern Manufacturing Methods, Design of Experiments, Machine Learning

Bachelor of Technology in Mechanical Engineering, Minor: Design **May 2022**
Sanjay Ghodawat University, India

TECHNICAL SKILLS

Design and Modeling Tools: Autodesk Revit, CATIA, SolidWorks, AutoCAD, ANSYS, Creo, Fusion 360, Arduino, Siemens NX, eQuest

Programming and Analysis tools: Python, MATLAB, Arduino, PLC, HMI, CNC coding, G code, SAP HANA, JMP

WORK EXPERIENCE

Rayn Innovation, USA: Process Engineer, Research and Development **Jan 2024 – Present**

- Invented and executed a cost-effective and zero-emission hybrid state-of-the-art CBD and spin-coating technique instead of using commonly used thin film deposition techniques like PEALD, PVD, and CVD, leading to a 4% faster deposition rate
- Led successful NSF project proposal by researching alternative thin film material - AZO (aluminum-doped zinc oxide) to overcome limitations of traditional materials in photovoltaic (PV) devices
- Executed comprehensive thin film characterization methods (SEM, TEM, EDX, XRD, UV-Vis) to improve the thin film uniformity
- Applied Design of Experiments (DOE) to improve deposition, boosting film quality by 8% and reducing defects/waste by 20%
- Performed electrodeposition experiments, demonstrating a 6% improvement in the uniform coating on copper film substrates

Marketech International Corporation, USA: Mechanical Engineer Intern, Project: TSMC Fab 21 **Jun 2023 – Aug 2023**

Tool Hookup – Interconnect:

- Worked directly on the TSMC F21 Tool Interconnect project to install and troubleshoot semiconductor tools, upholding strict safety and cleanroom protocols to achieve 100% on-time project delivery
- Designed and implemented an operational plan that completed the project 3% under budget and 2 weeks ahead of schedule leveraging FMEA, FTA, and data analysis using various analytical techniques
- Led quality inspection and maintenance of the semiconductor tools across ME, QA/QC, and Lithography process teams
- Diagnosed and resolved 50% of the equipment issues to ensure uninterrupted operation, reducing average downtime by 8%
- Implemented a real-time tracking system to monitor the stock level of equipment along with documenting the shipment

BIM Modeler:

- Collaborated with the Building Information Modeling (BIM) team in designing electrical and HVAC system models for the TSMC Fab cleanroom facilities and levels throughout the fab using Autodesk Revit
- Reviewed design specifications and developed comprehensive design packages that included the construction of electrical and HVAC systems, ensuring smooth coordination between different teams involved in the project

NASA, USA: L'SPACE Project Specialist **Aug 2022 – Dec 2022**

- Operated as project inspector for patent projects and developed project proposals with NASA Marshall Chief Technologist
- Utilized Siemens NX to create CAD design models and identified KPP (Key Performance Parameter) to optimize quantitative data

Chemtech System Marketing, India: Mechanical Engineer **Jun 2021 – May 2022**

- Led a team of 6 engineers to troubleshoot operating equipment, utilizing FMEA to identify and reduce manufacturing defects by 18%
- Performed root cause analysis and re-designed cutting blade angles with SolidWorks, improving the entire cutting operation by 80%
- Applied Lean Six Sigma principles to streamline quality control procedures, reducing manufacturing operational costs by 24%

PROJECTS AND RESEARCH

Advancing Thin-Film PV Efficiency, Manufacturing of Semiconductor Material and Process Innovation **Jan 2024 – Apr 2024**

- Investigation into thin-film solar PV technologies to achieve over 30% cell efficiency and large-scale manufacturing by 2035

Deposition Rate Optimization for Semiconductor Materials **Aug 2023 – Dec 2023**

- Increased semiconductor deposition rate by 32% from 50 to 65.24 via implementing Bayesian optimization techniques for parameter tuning using Python, reduced deposition time per substrate by 30% compared to conventional optimization methods

Computation Fluid Dynamics using ANSYS Fluent **Aug 2023 – Dec 2023**

- Designed and executed simulations of CFD and heat transfer analysis leveraging multiphase modeling, external aerodynamics, and transient instabilities using ANSYS Fluent, involving turbulent mixing, vortex dynamics, surface wetting, compressible flows

Optimizing Factors & Effects in Pour-Over Coffee Brewing with Design of Experiment **Aug 2022 – Nov 2022**

- Considered a 2k factorial design of DOE and ran an experimental design comparison using JMP software and conducted taste tests survey to identify critical response variables, maximizing the subjective appeal of coffee for customers

Formula SAE SUPRA, India: Head of Chassis Team **Aug 2020 – June 2021**

- Led a team of 25 students to design and model a Formula-1 car using CATIA and performed ANSYS finite element analysis (FEA)