**VARAD LAD**

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# SUMMARY

5 years of experience in mechanical design, CAD modeling with GD&T, integrating FEA/CFD per ASME/ASHRAE; hardware reliability and thermal testing of mechanical and opto-electronic devices; installing mechanical systems across data centers, fabs & aerospace fields

# WORK EXPERIENCE

**TSMC** | **Mechanical Engineer** | Mechanical Design, Data Center & Critical Facilities | Phoenix,AZ  **Jul 2024 – May 2025**

* Delivered critical facility system design and installation for 4nm, 2nm fab-utility and data center as a lead mechanical engineer
* Saved $120,000 in future maintenance costs by resolving PM issues via N+1 redundancy planning with operations reliability team
* Reduced equipment downtime 25% by diagnosing critical HVAC and abatement system failures in data center using SCADA logs
* Improved equipment reliability by troubleshooting critical environment cleanroom system, cooling towers, chillers and RCTO
* Achieved 0% construction rework by validating system P&IDs and PFDs and passing ICC, IBC, IFC and NFPA code compliance check
* Developed Power Bi and Tableau dashboards to streamline contractor milestones, commissioning, design submittals and city code reviews, which improved project timelines and enhanced stakeholder collaboration during mechanical package review

**Rayn Innovation** | **Senior Opto-Mechanical** **Engineer Intern** | R&D, Hardware & Thermal Test | Tempe, AZ  **Jan 2024 – May 2024**

* Boosted opto-electronic hardware performance and electric conductivity by synthesizing thin film via CVD, PVD, ALD techniques
* Detected 90% of surface defects in nano thin-film by performing metrology on microstructure using SEM, TEM, XRD, and UV-Vis
* Increased film uniformity by 12% and reduced material waste by 40%, by optimizing process parameters using DOE & SPC in JMP
* Tested hardware and thermal properties of coated semiconductors using controlled heating and sensor-based feedback systems
* Drove 28% yield performance gain of the product prototypes by enhancing thermal management through parameter tuning
* Improved synthesis-stage purity by 15% through big-data analysis of deposition variables and defect trends using JMP and Python

**Marketech International Corporation** | **Mechanical Engineer Intern** | Tool Interconnect | Phoenix, AZ **Jun 2023 – Aug 2023**

* Designed and improved utility connection reliability from 82% to 94% for 15 installed semiconductor critical-facility system tools • Reduced system downtime by 15% through effective troubleshooting of mechanical system in critical fab environment
* Resolved BIM system clashes and verified HVAC chillers and duct-system models in Revit, significantly reducing installation issues

**NASA** | **Mechanical Project Engineer Intern** | NASA L’SPACE Program| Tempe, AZ  **Aug 2022 – Dec 2022**

* Modeled and tested 40 CAD mechanical parts using Siemens NX, approved 7+ patentable projects and authored project proposals
* Identified 10 KPIs of each project in collaboration with NASA Marshall Chief Technologist, resulting in 15% project improvement
* Collaborated with aerospace engineering and chief scientists to develop system concepts for NASA mission simulation projects

**Chemtech Systems** | **Senior Mechanical Engineer** | High-Volume Manufacturing | India **Jun 2019 – May 2022**

* Led a team of 5 technicians in a 24/7 high-volume blade manufacturing plant to meet daily production and procurement targets
* Saved approximately $30,000 and reduced tool downtime by outsourcing predictive maintenance for the critical equipment
* Increased 80% cutting performance by identifying wear patterns & redesigning blades with CAD for self-sharpening functionality
* Saved $18,000 on the product testing costs by outsourcing final testing and commissioning to third-party contractors
* Applied FMEA methodology to identify and troubleshoot production defects in equipment during high-volume manufacturing
* Reduced annual BOM spend 18%, equivalent to $300,000 by building an ERP that auto-generated BOMs from CAD drawing and algorithmically ranked regional suppliers on cost, quality and certification, cutting sourcing cycle time by 66%

# PROJECTS

**Data Center Thermal Management System for Scalable Cooling Optimization**

* Improved cooling performance by 27% and reduced hotspots by 32% by simulating liquid vs air-cooling in SimScale using a Fusion

360-designed DC server hall, optimized VRF airflow zoning and adaptive fan control to benchmark efficiency across both methods

**Microsoft Underwater Data Center, Project Natick-inspired Land-Based Data Center Cooling Pod**

* Improved land-based data center thermal reliability by 25% and projected a 35–40% reduction in hardware failure rate by designing and simulating sealed, nitrogen-cooled pod environments modeled on Microsoft's Project Natick, underwater data centers

# TECHNICAL SKILLS & LEADERSHIP

**CAD Design & Simulation:** Revit, Siemens NX, ANSYS CFD/FEA (Icepak/Fluent), AutoCAD, SolidWorks, CATIA, Creo, Fusion 360, SimScale

**Data Analysis, Coding & BI Tools:** Python, MATLAB, JMP, SQL, DoE, SPC, Power BI, Tableau, RCA, FMEA, SAP HANA, PLC, HMI, G-code

**Leadership:** President of Employee Collaboration Club at TSMC, Spokesperson for past organizations (2 years), Technical Public Speaker

# EDUCATION

**Arizona State University** |Master of Science in Mechanical Engineering | Sun Award of Excellence Recipient **May 2024**