Muhammad Ijlal

US Citizen with valid SSN

27mijlal@gmail.com
(708) 916-9372
(Open to Relocation)
/muhammad-ijlal
Portfolio: muhammadijlal.com

Mechanical Design Engineer with **5+ years of experience** in **product design, structural analysis, and high-volume manufacturing** across battery technology, semiconductor, and industrial automation industries. Led designs that reduced **installation torque by 35%**, minimized **thermal expansion failures by 90%**, and saved **$20M/year in motherboard damages**. Managed **high-volume production of 10M+ parts**, collaborating with global suppliers on **GD&T, DFM/DFA, FAI, PPAP, and tolerance analysis** to ensure scalability and reliability. Skilled in **CAD modeling (SolidWorks, Creo, NX, Catia V5), FEA (Ansys), DOE, and root cause analysis**, with a track record of optimizing manufacturability, enhancing performance, and driving cost savings through data-driven design and cross-functional teamwork.

Experience

EATON CORP. **Remote**

Mechanical Product Design Engineer **May 2025 – *Present***

Eaton Corp. is a Fortune 200 global power management company providing energy-efficient solutions across industries. Muhammad worked on the EV Power Distribution & Protection team, designing HV protection systems for electric vehicles.

- Led **design, analysis, and validation testing** of progressive-stamped sheet metal components while collaborating with off-shore suppliers and internal cross-disciplinary teams, such as tool-design, manufacturing, and Supply Chain.
- Resolved crack propagation during assembly in an injection-molded part, **reducing defect rate from 100% to 0%,** by leading root cause analysis and optimizing supplier's manufacturing processes including hold time, cooling time, and over-molded inserts temperature to improve knit line strength.
- Led **root cause analysis** and **redesigned high-volume production parts** to resolve product functional failure due to assembly interference**.** Used GD&T, DFSS, DFA, DFM, and led **Monte Carlo tolerance analysis of 8 mating parts.**

Tools & Skills Utilized: *Creo, NX, SolidWorks, 3DX Enovia, DFSS, DFA, DFM, GD&T, Tolerance Analysis, & Root-cause Analysis*

INTEL CORP. **Hillsboro, OR**

Mechanical Design Engineer *(Impacted by company-wide reduction-in-force)* **Jun 2024 – Nov 2024**

Worked as a full-time Engineer in the Datacenter CPU Loading Mechanism team, responsible for designing and validating high-precision mechanical components for server-grade processors used in data centers worldwide.

- Led the design, analysis, and validation testing of injection molded Socket Cover, saving over **$20M annually** in potential damages to motherboards.
- Achieved **35% reduction** in installation torque using hand calculations, FEA, and rapid prototype testing, balancing shock, vibration, temp/humidity, durability, and deformation risks with design tradeoffs.
- Collaborated with 5 offshore suppliers on GD&T, DFA, DFM, FAI, PPAP, and tolerance distribution for injection-molded and machined parts, to enable **high-volume production of over 10M parts.**
- Spearheaded root cause analysis using Monte Carlo statistical tolerance analysis, pursuing solutions that minimized production disruptions and revalidation costs, **saving over $300K**.
- Led development and evaluation of next-gen Datacenter Xeon loading mechanism, established DOE testing procedures, **reducing testing time by 50%**, guided suppliers with data-driven corrective actions, and enabled POR design selection.
- Provided technical and business need deep dive to internal cross-disciplinary teams as well as high level executive summary for decision ratification to program director.

Tools & Skills Utilized: *Creo, SolidWorks, Ansys, Windchill, DFA, DFM, GD&T, Vendor/Supplier Management, Tolerance Analysis, & Root-cause Analysis*

TESLA INC. **San Diego, CA**

Battery Cell Mechanical Design Engineer **Jan 2023 – Aug 2023**

Part of the Battery Cell Mechanical Design team as an intern, focusing on initial mechanical design and validation of battery cell enclosure components to enhance performance, manufacturability, and large-scale production efficiency.

- Designed new mechanical features on deep-drawn steel cans, **reducing battery cell deflection by 30%**, exceeding performance requirement by **50%**, using FEA, testing, and analysis to improve production yield and cell thermals.
- Proposed and led a study to highlight critical production challenges based on first-principles of high-volume production process, **saving over $100K** and **cutting study time by 40%**. The study also resulted in a guide to improve future cell design.
- Executed validation testing on an upcoming cell's mechanical component by designing specialized fixtures, DOE trial plans, and vision-based laser weld programs, leveraging data-driven insights to address design changes and production challenges

Tools & Skills Utilized: *Catia V5, SolidWorks, Ansys, 3DX Enovia, DFA, DFM, DOE, GD&T, Rapid Prototyping, Tolerance Analysis, & Root-cause Analysis*

PREGIS INC. **Aurora, IL**

Mechanical Design Engineer **May 2022 – Dec 2022**

Interned at Pregis Inc. to design and develop innovative packaging solutions for customers like Amazon and Walmart, including machinery that inflates and seals packaging cushions.

- Led root cause investigation of machine failures and implemented solutions, including redesign of heating components resulting in **90% reduction in thermal expansion,** reducing machine failure from **70% to zero**, and **saving 40%** in production cost.
- Supported product performance improvement cycles, reducing the product startup time by **75%** while driving down cost, complexity and BOM quantity.
- Developed efficient, modular, and repeatable validation tests using custom test equipment, **saving ~$15K** in material expenses.
- Designed and released detailed 2D manufacturing, inspection and assembly drawings.

Tools & Skills Utilized: *SolidWorks, Ansys, PDM, DFA, DFM, DOE, GD&T, Cross-Disciplinary Collaboration, Tolerance Analysis, & Root-cause Analysis*

VISUAL COMFORT & CO. **Skokie, IL**

Mechanical Engineer **May 2021 – August 2021**

Visual Comfort & Co. designs and manufactures high-performance, innovative lighting solutions for architectural, residential, and commercial applications. Muhammad interned in the architectural department.

- Performed tolerance stack-up analysis, rapid prototyping, and designed multiple parts, including hardened spring-steel sheet metal parts from conception to manufacturing, currently in production at more than **30,000 parts/year** production rate.

Tools & Skills Utilized: *SolidWorks, PDM, DFA, DFM, DOE, GD&T, Cross-Disciplinary Collaboration, Tolerance Analysis, & Root-cause Analysis*

Education

Illinois Institute of Technology Chicago, IL

Master of Engineering in Mechanical and Aerospace Engineering (GPA: 3.8/4.0)

Bachelor of Science in Mechanical Engineering (GPA: 3.6/4.0)

Skills

Mechanical Design & Analysis: Creo, SolidWorks, NX, Catia V5, Ansys (FEA & Structural Analysis), & hand calculations.

Manufacturing & High-Volume Production: GD&T, DFM, DFA, DOE, supplier management, FAI, PPAP, tolerance distribution, injection molding, CNC, sheet-metal stamping, & deep-drawing.

Material Science & Failure Analysis: Structural failure analysis, Monte Carlo statistical tolerance analysis, mechanical durability assessment, & validation testing.

Gallup Strength Finder Top 5 Skills: Restorative, Analytical, Learner, Relator, and Responsibility.