Milan Dholakiya Mechanical Engineer (Robotics)

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Summary

Mechanical Engineer with 3+ years of experince specialization in Robotics and a strong foundation in mechanical design, automation, and system integration. Skilled in CAD modeling, robotic programming, simulation, and data analysis. Proficient in tools such as SolidWorks, CATIA, MATLAB, RobotStudio, and Python. Experienced in cross-functional collaboration, manufacturing optimization, and implementing intelligent, sustainable solutions in engineering environments. Committed to innovation, precision, and continuous improvement in high-performance technical settings.

Technical Skills

- **Robotics & Automation**: ABB (RAPID), KUKA (KRL), RobotStudio, C++, PLC basics
- **3D Modeling & CAD**: SolidWorks (CSWA Certified), CATIA, AutoCAD, CAD Assembly & Drafting
- **Simulation & Analysis**: ANSYS, Simscape, MATLAB, Simulink, SolidWorks Simulation, Finite Element Analysis (FEA), Stress & Thermal Analysis
- **Programming & Software**: Python, OpenCV, LabVIEW, QUARC, VBA (Excel automation)
- **Manufacturing & Process**: DFMA (Design for Manufacturing & Assembly), Poka-Yoke (Error Proofing), Lean Manufacturing (Kaizen, 5S), GD&T (Geometric Dimensioning & Tolerancing), CNC Machining fundamentals
- **Project & Data Management**: Microsoft Project, Teamcenter PLM, Excel (modeling, statistical analysis, pivot tables)
- **Prototyping & Fabrication**: 3D Printing, Laser Cutting, Rapid Prototyping Techniques
- **Sensors & Instrumentation**: Force-feedback sensors, Ultrasonic Proximity sensors, INA260 current sensors, Industrial cameras
- **Quality & Testing**: BOM creation, Calibration, FMEA (Failure Mode and Effects Analysis), Root Cause Analysis
- **Soft Skills**: Effective Communication, Team Collaboration, Problem Solving, Critical Thinking, Time Management, Adaptability, Leadership, Attention to Detail
- **Documentation**: Technical Writing, Report Preparation, Standard Operating Procedures (SOPs), User Manuals, Design Documentation, Meeting Minutes, Version Control, Compliance Documentation

Professional Experience

Mechanical Engineering (Robotics), Ford Motor Company 01/2024 – Present | California, USA

- Worked on "Robotic Arm Integration for Automotive Assembly Line" and "Robotic Vision System for Defect Detection" using SolidWorks and CATIA for 3D modeling and robotic cell layout. Simulated paths in RobotStudio for cycle-time and spatial efficiency.
- Programmed ABB and KUKA robotic arms using RAPID and KRL, collaborating with automation and controls teams to develop synchronized robotic movements. Used C++ to refine motion logic and enhance real-time system response.
- Designed modular robotic end-effectors with integrated force-feedback sensors, using ANSYS for stress validation and Simscape to simulate dynamic interaction. Ran alongside tooling and manufacturing engineers for robustness under varied loads and speeds.
- Developed a real-time defect detection system using OpenCV, Python, and industrial cameras. Collaborated with quality assurance teams, reducing visual inspection time by 60% and improving defect detection rate by 45% within the first 3 months.
- Conducted energy efficiency assessments within robotic assembly environments, identifying process inefficiencies and implementing automation-driven optimizations that improved cycle time and reduced energy consumption across multiple production cells.
- Performed robotic system validation using MATLAB for data analytics and Simulink to simulate control loops and sensor responses. Leveraged Excel modeling and statistical analysis to optimize inspection accuracy, cycle time, and process stability.
- Applied Poka-Yoke (error-proofing) principles during integration to minimize maintenance errors. Documented all systems with BOMs, calibration logs, and FMEA reports. Coordinated with project and maintenance teams using Microsoft Project and Teamcenter PLM.
- Collaborated cross-functionally with field teams and manufacturing stakeholders to integrate data-driven, sustainable solutions into robotic systems, leveraging analytics to enhance operational efficiency and support long-term resource optimization.

R & D Engineer, Goldi Solar PVT LTD 08/2021 – 10/2022 | Surat, India

- Designed and enhanced mechanical assemblies and production tools, improving manufacturing efficiency and automation by 25%, resulting in smoother operations and higher throughput within high-volume solar panel production lines.
- Led validation and verification of designs through simulations and real-world tests, increasing design reliability by 30% and reducing product failures under industrial operating conditions.
- Troubleshot mechanical issues on production lines, cutting downtime by 20% through innovative solutions that addressed recurring design challenges and maintained continuous production flow.
- Conducted Finite Element Analysis (FEA) to optimize structural integrity, extending component lifespan by 35% and ensuring durability of custom fixtures and assemblies.
- Collaborated with interdisciplinary teams to standardize processes, boosting manufacturing productivity by 15% and lowering costs by 10% through scalable and consistent techniques.
- Refined manufacturing methods by integrating team feedback, increasing overall process automation by 18% and supporting sustainable growth of solar panel production capacity.

Mechanical Engineer, Divine Engineering Services Pvt Ltd 07/2020 – 07/2021 | Surat, India

- Directed the Design and Fabrication of Custom Material Handling Systems using SolidWorks for 3D modeling and AutoCAD for technical drawings, ensuring precise design for material flow, load-bearing capacity, and seamless system integration into client facilities.
- Utilized SolidWorks for detailed mechanical design and motion simulations, identifying potential interferences, optimizing conveyor kinematics, and performing FEA to validate structural strength and fatigue resistance, ensuring system reliability and durability.
- Applied AutoCAD to create 2D layouts, detailed schematics, and assembly instructions, easing clear communication between design, procurement, and fabrication teams for accurate and efficient fabrication with precise alignment to production line specifications.
- Coordinated with procurement and fabrication teams, applying DFMA principles to optimize component selection, material efficiency, and ensure cost-effective production of rollers, gearboxes, motors, and structural frames for seamless integration.
- Applied Lean tools such as Kaizen and 5S to streamline installation processes, reduce assembly time, eliminate waste, and enhance operational flow, resulting in improved productivity, minimized downtime, and better overall system performance.
- Managed the full project lifecycle, from design validation to commissioning, forming full project documentation, including BOMs, CAD archives, upkeep guides, and scheduling reports, using Microsoft Project and Excel for resource planning, tracking, and cost control.
- Supported rapid prototyping and iterative design improvements by integrating 3D printing and laser cutting methods, Advised cross-functional teams on additive manufacturing best practices during concept development stages, enhancing efficiency in tooling and component prototyping.

Research & Projects

Vision-Guided SCARA Robot for Image Replication & Force-Controlled Drawing **San Francisco State University – 05/2025**

- Applied real-time image edge extraction and path planning using MATLAB and Simulink integrated with QUARC to control the QArm manipulator for live drawing replication.

4-DOF Robot Arm Safety Implementation Using Ultrasonic Proximity and Current Sensors **San Francisco State University – 12/2024**

- Implemented real-time decision logic in LabVIEW and monitored performance via INA260 current sensors and serial data logging under dynamic workspace conditions

Numerical Simulation of Unidirectional Composite Materials (Undergraduate Thesis) **Riga Technical University – 05/2020**

- Simulated the tensile loading of breakable composite structures in SolidWorks Simulation to visualize force distribution, deformation, and stress concentration zones, and analyzed how material behavior changes across different mechanical loading scenarios.

Education

Master of Science in Mechanical Engineering – Specialization in Robotics
San Francisco State University 08/2023 – 05/2025 | San Francisco, California, USA

Bachelor of Science in Mechanical Engineering
Riga Technical University 09/2017 – 06/2020 | Riga, Latvia

Certifications & Awards

- **Certified SolidWorks Associate (CSWA) – SolidWorks Design Software**
- **MATLAB Online Training Certifications – MATLAB Fundamentals, Simulink Onramp, Simscape Onramp, and more**
- **University Golden Fund Award – Riga Technical University, Riga, Latvia**
- **Graduate ETAMSF Scholarship – ASHRAE Golden Gate Chapter, San Francisco**
- **Graduate Scholarship (2024) – SFSU Alumni Association**