Roopinder Singh

MECHANICAL ENGINEER - CAD Design, Analysis and simulation, Process Optimization

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SKILLS

- **Advanced CAD Tools:** SolidWorks, AutoCAD, Autodesk Fusion 360, GD&T,3D models, assembly designs.
- **Simulation and Analysis:** Performed structural, thermal, FEA simulations using ANSYS Workbench, SIMULINK.
- **Programming:** Python, MATLAB, ArduinoIDE, C++, APDL, data analysis, control system development.
- **Product Management:** SolidWorks PDM, SAP S4 Hana, Advanced Excel, PowerBI , data visualization.

WORK EXPERIENCE

Research Engineer   **January 2023 - October 2023**
National Research Council of Canada, Remote, Ottawa

- Generated CAD models for bridge components, improving design accuracy by 30% and reducing manual redesign.
- Analyzed load-carrying capacities using simulations & calculations, streamlining processes across 10 projects.
- Boosted simulation efficiency by 20% through maximized boundary conditions and high-quality mesh generation.

Junior Product Engineer (Co-op)   **August 2021 – December 2021**
PolyUnity Tech – CHEO Hospital, Remote, Ottawa

- Crafted 20+ 3D-printed components, reducing development time by 25% & increasing product reliability.
- Revamped production efficiency by 40% through process enhancements, effective collaboration, & agile workflows.
- Mitigated equipment downtime by 15% through troubleshooting and maintenance of 3D printing systems.

Engineering Intern   **June 2018 - August 2018**
Maruti Suzuki, India

- Upgraded assembly workflows, reducing rejection rates by 10% & enhancing consistency across production lines.
- Minimized defects by 15% through tool adjustment, ensuring CNC equipment operations & tolerances.
- Identified production bottlenecks, reducing delays by 20% through root cause analysis and workflow optimization.

Engineering Intern   **May 2017 - June 2017**
Indian Railways, India

- Reduced inspection times by 20% through refined track alignment methods, enhancing efficiency.
- Controlled material performance tests, increasing rail component durability by 15% through recommendations.
- Reduced equipment downtime by 10% by designing schedules and ensuring execution during downtime.

Engineering Intern   **March 2017 - April 2017**
Indira Gandhi International Airport, India

- Reduced equipment repair response times by 15%, enhancing reliability & ensuring servicing of airport operations.
- Supervised energy audits, identifying inefficiencies & achieving 8% operational savings by optimized power usage.
- Enhanced documentation, improving maintenance consistency by 12% through streamlined recording methods.

PROJECTS

DTU SuperMileage Vehicle – Urban and Prototype Concept   *Steering and Brakes Department*

- Revitalized steering and braking systems, enhancing vehicle performance with a mileage of 150 km/kWh, while collaborating across departments to ensure optimal design and compliance with safety standards.

Computer Vision-Based Road Surface Detection   *Simulation Lead*

- Developed a CNN-based detection system using TensorFlow, Keras, and OpenCV, achieving 90% accuracy in detecting road surfaces, and validated the system's performance on over 50 diverse image samples.

ARTICLES

Development and Analysis of a Thermo-Electric Generator to Incorporate in a Roof-Top Water Tank.
International Conference for Advanced Production and Industrial Engineering October 2017

- Conducted thermal analysis using ANSYS, validating thermo-electric coefficients from commercial units, optimizing heat flux distribution, leveraging finite element methods, & achieving an efficiency improvement.
- Demonstrated a green energy solution with noiseless operation, converting waste heat at temperatures below 500K to electrical energy using Seebeck effect principles, thermo-electric modules, and heat sink optimization.

EDUCATION

Master of Engineering – Mechanical Engineering   September 2020 – April 2023
University of Ottawa, Ottawa, Canada

Bachelor of Technology – Mechanical Engineering   August 2015 – June 2019
Delhi Technological University, Delhi, India

CERTIFICATIONS

- SOLIDWORKS: Design for Mechatronics, SOLIDWORKS: Sheet Metal Design Introduction to Geometric Dimensioning and Tolerancing , Introducing Robotic Process Automation , Learning MATLAB.