RISHI RAJ

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EDUCATION

Bachelor of Technology - Mechanical Engineering — Ranchi, Jharkhand
Birla Institute of Technology, Mesra | CGPA: **8.42** / 10.0 — 2021 - Present

Class 12 (Intermediate) — Jamshedpur, Jharkhand
D.A.V. Public School | Percentage: **90.0** / 100 — 2018 - 2020

Class 10 (Matriculation) — Jamshedpur, Jharkhand
Tarapore School | Percentage: **87.0** / 100 — 2005 - 2018

SKILLS

AutoCAD · SOLIDWORKS · ANSYS · Simcenter STAR- CCM+ · Python · MS-Excel · Power BI · MS-Office · Problem Solving · Analytical Thinking · Computation Fluid Dynamics · Turbomachinery · Project Management · Business Acumen · Strategic Planning · Supply Chain Management

EXPERIENCE

Tata Steel — Jamshedpur, Jharkhand
Mechanical Engineering Intern — 05/2024 - 07/2024

Key Skills: Leveraged problem solving skills by applying mechanical engineering principles, material science knowledge, simulation for analysis and documentation as primary objective of this project is to increase the reliability of braking pinch roll assembly in New Bar Mill.

- Identified and addressed reliability issues in the braking pinch roll assembly by conducting root cause analysis and proposing solutions.
- Improved reliability and lifespan of the braking pinch roll assembly, leading to reduced downtime and increased operational efficiency.
- Applied problem-solving to recommend enhancements such as improved assembly procedures and surface hardening of pinch rolls.
- Improved reliability and lifespan of the braking pinch roll assembly, leading to reduced downtime and increased operational efficiency.

PROJECTS

Optimization studies of the Hydrokinetic Turbine (Savonius) Blade Design for Enhanced Torque Performance (currently in progress).

Associated: Associate Researcher working under Dr. Lakhbir Singh Brar, Assistant Professor, MECHANICAL, BIT MESRA | Aug 2024 - Present
Key Skills: Expertise in Computational Fluid Dynamics (CFD) , Turbomachinery, SOLIDWORKS for modelling and Star-CCM+ for simulation as the primary objective of this project is to enhance the overall average torque output coefficient by enhancing blade turbine design.

- Utilized SOLIDWORKS for precise rotor and stator geometry design and incorporated various blade geometries (semi-circular, airfoil, elliptical) for comparative analysis.
- Applied advanced turbulence models (K-epsilon, K-omega) and performed thorough post-processing to extract critical insights into turbine performance.
- Implemented Genetic Algorithm and Artificial Neural Networks based on CFD simulation results to optimize blade redesign parameters (fillet radius, blade angle, slot gap), leading to higher efficiency at different Tip Speed Ratios by calculated torque and power coefficients.
- A highly optimized turbine blade design with improved torque and power coefficients, contributing valuable insights to turbine efficiency.

Simulation of classical case of flow over cylinder and observed the Karman vortex street phenomena from laminar to turbulent flow.

Key Skills: Expertise in Computational Fluid Dynamics (CFD) , ANSYS Fluent, Python for data insights and visualization, and mesh generation techniques and proficiency in applying theoretical fluid mechanics concepts such as Reynolds and Strouhal numbers.

- Simulated the flow over a circular cylinder to study the Von Karman vortex street phenomenon, focusing on various Reynolds numbers ranging from laminar to turbulent flow regimes. Experience in analyzing transient and steady-state fluid dynamics problems.
- Designed and meshed 2D surfaces using ANSYS Fluent, ran steady and transient simulations, and post-processed results for lift, drag, and Strouhal numbers. Used Python for data visualization and plotting key graphs related to flow characteristics.
- Expected possible outcome is the deeper understanding of vortex shedding phenomena applicable to engineering design for findings aid by predicting resonance across it and provided insights into vortex shedding dynamics critical for design optimizations in fluid dynamics.

Operations and Network Optimizations of Supply Chain Performance focussing on the inventory management and shipment delay

Key Skills: Supply Chain Management, Problem Solving, Power BI skills for primary focus is on addressing key challenges related to delay shipment and inventory management within supply chain strengthen supplier relationships, contributing to enhanced operational efficiency.

- Conducted a comprehensive analysis of supply chain inefficiencies, focusing on business downturn, inventory management, supplier networks and shipment systems to identify bottlenecks and streamline processes for improved business performance.
- Formulate actionable strategies to optimize inventory levels, reduce shipment delays, and strengthen supplier relationships, contributing to enhanced operational efficiency that can improve customer satisfaction, lower costs, and set a foundation for long-term growth.
- Enhanced abilities in business acumen, supply chain analysis, and data-driven decision-making, with a strengthened capability to address complex supply chain management principles and business analytics challenges through analytical and technical approaches.

EXTRA CURRICULAR ACTIVITIES & HOBBIES

- Watching and Playing Cricket
- Playing Standard 52- Deck Cards & 8 Ball-Pool game
- Playing Airsoft Gun Shooting