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Mechanical Engineering
Bachelors of Engineering
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LinkedIn Profile

Education

- **Jadavpur University, Kolkata** *2024*
  Bachelors of Engineering, Mechanical Engineering CGPA(upto 5th sem) : 8.76
- **Don Bosco School, Liluah** *2020*
  Indian School Certificate Percentage: 95 %
- **Don Bosco School, Liluah** *2018*
  Indian Certificate of Secondary Education Percentage: 95.6 %

Experience

- **York University** *May - Aug '23*
  MITACS Global Research Intern Toronto, Canada
  - Colaborated with **MAGNA Co.(Ontario)** in testing **4 mechanical properties** of heat pipes i.e. **porosity**(ϵ), **effective pore radius**(r_{eff}), **liquid permeability** (K) & **capillary performance** (K/r_{eff}).
  - Implemented **PLA & PET-G manufactured** new test rig design for thermal analysis if **4 strut-based** wick structures i.e. **SC, BCC, FCC** & **Fluorite** used in electronics cooling.
  - Investigated various wick manufacturing techniques **(LBPF** and **ECM)** and studied their thermo-mechanical properties when used in temperature conditions in the range of **45°C** to **95°C**.

- **TATA Motors** *May '22*
  Industrial Trainee Jamshedpur, India
  - Researched various quality parameters including **Manufacturing Process Control**, **Regulatory Compliance**, and **Fit and Finish** to ensure high-quality standards and efficient production processes.
  - Proficient in analyzing and managing reliability metrics, including **Machine Bill of Material (BOM)** rates, **Geometric Dimensioning and Tolerancing**, and **chassis failure**, to identify areas for improvement and enhance overall batch performance.
  - Contributed to noise, vibration, and harshness **NVH** reduction and ensured reliability in engine mounts & locomotive exhaust for trucks, enhancing overall vehicle performance.

- **Usha Martin, Wire and Ropes Division** *June '22*
  Industrial Trainee Ranchi, India
  - Experienced in advanced metallographic analysis using optical microscopy, spectro machine operation, and **LECO-Carbon and Sulphur determination (TXC-25)** for **failure analysis** and microstructural characterization in metal components using **7-QC** tools.
  - Proficient in conducting calibration and measurement technology with **metrological traceability**, and participating in proficiency testing for accurate results and quality improvement.
  - Skilled in wire rod **pickling** with advanced techniques, ensuring high-quality products through **phosphating film protection**, **saponification**, and meticulous monitoring of key parameters, adhering to **ISO 9001 standards**.

Personal Projects

- **ISIE-IKR(Indian Karting Race) 2023** *Jadavpur University*
  Structural Analysis of Go-Kart manufactured by Jadavpur University Motorsports Club Dec '21 - present
  - Tools & technologies used: DS SolidWorks, ANSYS
  - Proficient in **Structural Damage Assessment and Repair**, utilizing real-world stress testing simulations to accurately assess and enhance go-kart performance and safety at **70 kmph** under **4 g force**.
  - Procured and physically assembled go-kart, showcasing hands-on expertise.
  - Demonstrated **Finite Element Analysis (FEA)** skills, optimizing a **70 kg driver** + **sprung-mass of 30kg** weight distribution for improved handling, reducing body roll during turns, and enhancing overall performance.

- **Design and Analysis of Composites on Pressure Vessels in Naval Application(DRDO)** *IIT Kharagpur*
  Calculating the optimal winding angle and mandrel rotation speed for best mechanical properties June - July '23
  - Tools & technologies used: ABAQUS

- Researched **cyano-acrylate epoxy resin** with **carbon fiber** composites, optimizing mechanical properties, and validating performance with FEA simulations on ABAQUS under **fatigue stresses of ±100 atm**.
- Implemented a winding angle of **52.6 degrees** to the axis of the mandrel, resulting in a robust structure capable of withstanding external pressures **up to 150 atm** at a **depth of 4000 ft**.

• **Modeling of bubble dynamics in superheated and subcooled liquid.** *Jadavpur University*
Employed modeling techniques to investigate bubble dynamics in subcooled liquids. Aug - Dec '22

- Tools & technologies used: MATLAB
- Examined **Rayleigh**, **Clausius Clapeyron** and **Real Gas Equation** to arrive at nucleation condition of bubble at subcooled condition i.e. **363.15K**.
- Studied the trends of **bubble surface temperature**, **bubble radii**, and **bubble film pressure**.
- Leveraged bubble dynamics expertise to reduce **cavitation induced implosion damage** in marine propellers by **10%**.

Related Subjects Taken

Internal Combustion Engines
Strength of Materials
Heat Transfer
Basic Control System Theory

Technical Skills and Interests

Languages: Python, Java, SQL
Softwares: DS SolidWorks, MATLAB, Simulink, AutoCAD, Microsoft Excel, ABAQUS, Tableau
Soft Skills: Leadership, Teamwork skills, Problem-Solving Skills, Adaptability and Flexibility
Areas of Interest: Football, Music(Keyboardist), Video Editing

Positions of Responsibility

• **Technical Head,** Team XLR8, Jadavpur University Motorsports Club *Apr '23 - present*

- Led the **60 member** team in the motorsports club of the college, overseeing the successful design and construction of the first go-kart, demonstrating strong leadership and engineering skills.
- Spearheading the transition to **Electric Vehicle** technology involved in Powertrain Design and Chassis design in collaboration with Kolkata-based startup **Dabadigo**.

• **Chassis Head,** Team XLR8, Jadavpur University Motorsports Club *Aug '22 - Apr '23*

- Mentored junior engineering students through comprehensive classes on **powertrain**, **thermodynamics**, and **internal combustion engines**, imparting in-depth knowledge and fostering their understanding of critical engineering concepts.
- Facilitated hands-on workshops for junior students, instructing them in the effective utilization of **ANSYS** and **DS SolidWorks** software for design and simulation purposes, empowering them with valuable engineering tools and skills.

• **Founding Club Member,** Research Society *Sept '21 - present*

- Instrumental in establishing and actively contributing to a research-oriented club, promoting a culture of inquiry and exploration among students.

• **Core Committee Member,** Music Club *Dec '21 - present*

- Active club member, represented college at inter-college solo and band events during **Sanskriti'23** as a keyboardist.

Achievements

• **Winners -** Airbus Day Innovation Challenge: Our proposed sustainable idea for better air travel was "Exploring Algae-based Sustainable Aviation Fuel **(SAF)**". *Sept '22*

• **Finalist -** Ace The Case(Srijan): A college case study competition on Boosting Life Insurance Penetration through Innovative Approaches ,organised by JU's technical fest. *Mar '23*

• **Qualifiers -** Vishwakarma Makers Bhawan Competition 2023 : Pioneered a **sustainable** engineering solution to a battery management system problem, achieving an impressive **15%** reduction in heating losses by implementing heat pipes for efficient cooling. *Jun '23*