ATHARVA RANE

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OBJECTIVE

I am a graduate student aiming to leverage my knowledge as a mechanical and materials science engineer to further understand materials processing/history and its impact on structure and properties. Currently seeking a co-op or full-time opportunity from April 2025.

EDUCATION

1. **Michigan Technological University,** Houghton, Michigan
   MS Materials Science and Engineering, GPA 3.74/4   Aug 2023 to Apr 2025
2. **University of Mumbai,** Mumbai, India
   BS Mechanical Engineering, CGPA 7.7/10   Aug 2017 to May 2021

PROFESSIONAL/INTERNSHIP EXPERIENCE

- **Materials Science and Engineering Intern**, Sintokogio, Nagoya, Japan   May 2024 to Aug 2024
  Duties: Worked with the Ceramics R&D team on the newly released Additive Manufacturing machine (M.A.T.) setup for Beta-Alumina. Tested 3D printing parameters and their effects on the properties and the microstructure and optimize printing methods and develop SOP.
  Worked with the NPS team to optimize the Impeller assembly area to reduce lead time by 9%.
  Worked with the NPS team to apply continuous improvement principles to the receiving floor and saw a total 15.3% reduction in lead time in receiving and 26.3% increase in normal work time in sorting.

- **Mechanical Engineer,** Sheth Infrastructure, Mumbai, India   Feb 2022 to May 2023
  Duties: Worked with engineers on Design of Electrical Systems and CAD layouts. Part of the Machine Maintenance team responsible for testing and recording machine errors, sending machines for scheduled maintenance and checkups and maintaining machines in operating conditions.

RESEARCH EXPERIENCE

- **Research Assistant** to Dr. Bruce Pletka   Jan 2024 to May 2024
  Title: Study and analysis of beta-alumina structures.
  Details: Studied the structure of Beta-alumina using X-ray diffraction to understand preferred orientation of the material. Used X-ray fluorescence to understand the basic chemistry and composition of beta-alumina. Used the data obtained to understand the tensile properties exhibited by the material to understand the structure-property relationship and hypothesize the behavior of similarly structured magnetoplumbites.

- **Research Assistant** to Dr. Timothy Eisele   Aug 2024 to Present
  Title: Aerobic organic leaching of Manganese and Iron.
  Details: Conducting XRD, XRF, ICP and SEM analysis of products obtained from bio-leached manganese and iron ore. Products include manganese and iron oxides and sulfides.
  Managing pilot plants for the leaching. Setting up experiments required for other similar analyses as required.

PROJECTS

- **Senior Year Project**:   Aug 2020 to May 2021
  Title: Study of Compressible Flow using CFD.
  Details: Used ANSYS and MATLAB to run simulations on CD nozzle and understand Compressible Flow and analyze shock.

- **Metal Castings Projects: Alloy Design and Structure-Property relationships.**   Aug 2024 to Dec 2024
  Cast Iron: Simulated casting, designed molds, and cast ductile iron stein and pans. Calculated nodularity for gray iron castings and area fraction of graphite and conducted tensile tests and ICP-OES on all cast alloys.

Aluminum: Cast A356 and A390, performed tensile tests, microstructure analysis and relate the structure properties to understand effects of various alloying elements and composition. Analyzed the effects of using different mold materials on the properties of aluminum.

- **Lear Corporation (Advanced Metalworks Enterprise)**   Jan 2025 to Present
  Working with a team of Material Science and Engineering students and advisors for Lear Corporation, simulating the wire crimping mechanism and conducting humidity and corrosion analysis on copper wire to understand voltage drop due to corrosion.

MINOR PROJECTS

- **Title:** ESEM analysis of corroded Fe.   Aug 2023 to Dec 2023
  Details: A pure Fe sample was corroded to various degrees. EDS data from an environmental SEM was used to understand the corrosion on various areas on the surface of the sample.

- **Battery Recycling Project assistant**   Aug 2024 to Present
  Assisting in experimental setup and analysis of battery recycling project conducted by Dr Lei Pan team at Michigan Technological University. Analysis includes XRD, XRF, SEM, ICP and Spectrophotometry.

COMPUTER SKILLS

Windows, MATLAB, Mathematica, AZtec, FactSage, MDI Jade, Thermocalc, Inspire Cast, ANSYS, AutoCAD, SolidWorks, Minitab

TECHNICAL SKILLS

Scanning Electron Microscopy, Biomass decomposition, Hydrometallurgy, Mineral Processing, Pyrometallurgy, X-Ray Diffraction, Volume Fraction Analysis, Corrosion/Environmental Effects, Mechanical Behavior of Materials, Failure Analysis, Thermodynamics and Kinetics, Materials Processing, Production Processes, Metal Casting, Operations Management, Statistical Quality Design and Control, Design of Experiments(DOE), Root Cause Failure Analysis, Lean, Continuous Improvement.