

Nicholas Sabry

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Objective Statement

As a Ph.D. in mechanical engineering, I aim to pursue a career in mechanical or manufacturing engineering with a focus on product development. With experience in aluminum battery tray production, welding processes, and stress field measurements, I strive to apply my knowledge in a hands-on manufacturing facility to enhance production efficiency across various industries. I employ a flexible, practical, and principles-first approach to bringing new products to life.

Skills

MATLAB, Python, FEM, SolidWorks, Arduino Uno | SEM, EDX, XRD, EBSD for Texture Analysis, Tensile, Fatigue, Fracture, Hardness, Neutron Diffraction for Stress Analysis | Lathe, Mill, Waterjet, Welding, CNC, Casting, 3D Printing | Proficient Presenter and Communicator, Technical Communications and Writing, Fund Acquisition | Leadership, Problem-solving, Critical Thinking, Adaptability, Collaboration

Experience

- May '20 — Jul. '24 **Mechanical and Materials Science Researcher**, High Performance Powertrain Materials Laboratory (HPPM)
- My focus within the HPPM laboratories was leading the friction stir welding (FSW) research project, which is utilized in the production of our industry partners' (*Nemak*) battery trays for electric and hybrid vehicles.
- Simplified the complex geometry of the battery tray for analysis to enhance understanding of stress field measurements, utilizing *nuclear technologies* to study stresses in *friction stir-welded* aluminum (Al) plates.
 - Successfully delivered two presentations on friction stir welding and residual stress to 50+ *senior engineers* at *The Minerals, Metals & Materials Society (TMS)* conference, securing referrals and networking opportunities by making complex topics accessible and engaging.
 - Developed a report detailing methods to minimize distortion and improve production efficiency for the *hybrid 4XE Jeep Rubicon* battery tray, by facilitating an international collaboration among *Nemak R&D, Oak Ridge National Lab, and the Nemak Alabama production facility*.
- Sep. '20 — Dec. '23 **Graduate Teaching and Research Assistantships**, University of British Columbia
- Led five sections of approximately *200 students* in machining processes, including casting, forming, welding, metrology, and traditional machining, by designing lectures to streamline engineering equations and principles.
 - Consistently received positive feedback for demonstrating *strong leadership and effective presentation skills*.
- Sep. '19 — Jun. '20 **Engineering Intern**, Tolko Industries
- Collaborated in a team to enhance Tolko Industries' production processes, *tripling* fruit bin output annually.
 - *Led* motion study analysis to pinpoint improvements for safety and efficiency in fruit bin manufacturing operations.
 - Redesigned final assembly to boost operational efficiency, reduce production time, and cut space requirements.
- May '18 — Aug. '18 **Research Intern**, Lund University (Sweden)
- Completed aluminum (Al) alloy characterization at Lund Institute to evaluate next-generation internal combustion engine material using *tensile and fatigue analysis*.
 - Employed fractography methods to collect precipitation-strengthened Al alloy fracture data, defining ductility and toughness.
 - Conducted acoustic emission testing with tensile tests to aid in understanding deformation in the pre-elastic limit.
- Sep. '18 — Apr. '18 **Battery Innovation Project Assistant**, University of British Columbia
- Analyzed *Panasonic GA and Samsung 30Q* battery cells cycling to measure performance degradation under varied usage conditions.
 - Analyzed data for patterns of performance loss to create efficient charging technologies and extend battery life.

Education

- May '20 — Jul. '24 **Ph. D. in Mechanical Engineering**, University of British Columbia
- Dissertation: "Development of Friction Stir Welding on Large Multi-Welded Components Residual Stress, Distortion, and Crystallographic Texture in Lap Joints of Aluminum Alloys"
 - Published several articles in *high-impact journals* to efficiently communicate my dissertation findings to the broader scientific community.
- Sep. '16 — Apr. '20 **BASc in Mechanical Engineering**, University of British Columbia
- GPA: 3.9 / 4.0 with *Distinction*.
 - Applicable Courses: Applied Machine Learning, Alternative Energy Systems, Heat Transfer Applications, Microelectromechanical Systems, Mechanics of Materials, Robot Modelling and Control, Manufacturing Processes, Kinematics and Dynamics of Machinery, and Advanced Manufacturing CAD/CAM/CAE.