

Nicholas Sabry

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Objective Statement

As a Ph.D. candidate and mechanical/materials research scientist, I aim to pursue a career in mechanical or manufacturing engineering focused on product development. With experience in applied research related to battery tray production, welding processes, and stress field measurements, my focus is on improving production efficiency in the electric and hybrid vehicle industry. My toolkit includes machining techniques such as lathe, mill, waterjet, welding, CNC, and 3D printing, as well as CAD/CAM software, technical communication, and SEM analysis. I bring a flexible, practical, and principles-first approach to bringing new products to life.

Experience

- May '20 — Present **Mechanical and Materials Science Researcher**, High Performance Powertrain Materials Laboratory (HPPM)
- Within the HPPM laboratories, my focus is on battery tray production for electric and hybrid vehicles. This effort involved building partnerships with research centers across the world.
- 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 plates.
 - 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 Jeep Rubicon hybrid battery tray, by facilitating an international collaboration among Nemak R&D, Oak Ridge National Lab (ORNL), and the 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.
- 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
- Completed 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 — May '24 **Ph. D. in Mechanical Engineering**, University of British Columbia (Expected Completion: End of June 2024)
- Dissertation: "Stress Characterization for Friction-Stir-Welded Hybrid Electric Battery Trays with Application of Neutron Diffraction"
 - 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.

Skills

MATLAB, SolidWorks, Arduino Uno, SEM/Material Analysis, Lathe/Mill/Waterjet/Welding/CNC/3D Printing, Proficient Presenter and Communicator