Nicholas Sabry

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Objective Statement

Mechanical and materials research scientist pursuing a career in mechanical or manufacturing engineering for product development. The pursuit of my Ph. D in mechanical engineering is driven by my passion to tackle challenging problems and contribute innovative solutions. My goal is to transition into a role where I can apply the knowledge and skills I've acquired, partnering with organizations to research and develop solutions to real-world industry problems. My toolkit includes multiple programming languages, CAD/CAM software, machining techniques, technical communication, and a variety of analytical methods. My approach is to bring a flexible, practical, and principles-first view 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 collaboration with key laboratories and institutions across the world, including ANSTO, TMS, Nemak, and ORNL.

- Utilized nuclear technologies at Australian Nuclear Science and Technology Organisation (ANSTO) to produce neutrons for studying stresses in friction stir-welded aluminum (Al) plates, analyzing weld sequence and parameters' effects on residual stress. This work simplified the complex geometry of the battery tray for analysis, using the same material and welding tool to enhance understanding of stress field measurements studied on the battery tray in previous experiments at ORNL.
- Delivered two talks at The Minerals, Metals & Materials Society (TMS) on friction stir welding and residual stress to 50+ senior engineers, securing referrals and networking opportunities by leveraging carefully made presentations to elucidate complex topics and sustain audience engagement.
- Facilitated an international collaboration among Nemak R&D, Oak Ridge National Lab (ORNL), and the Alabama production facility, resulting in a strategic 40-page report detailing methods to minimize distortion and improve production efficiency for the Jeep Rubicon hybrid battery tray. This report spurred multiple follow-up studies across various institutions (i.e. ANSTO) to address new scientific questions about friction stir welding and residual stress.

Sep.'20 — Dec.'23 **Graduate Teaching and Research Assistantships** - University of British Columbia

- Led five sections totalling ~200 students in machining processes, including casting, forming, welding, metrology, and traditional machining, while designing lectures to streamline engineering equations and principles.

Sep.'19 — Jun.'20 **Engineering Intern** - Tolko Industries Production Enhancement

- Collaborated in a team, enhancing Tolko Industries' production processes tripling fruit bin output annually.
- Led motion study analysis, pinpointing improvements for safety and efficiency in fruit bin manufacturing operations.
- Redesigned final assembly, boosting operational efficiency, reducing production time, and cutting space requirements.

May '18 — Aug.'18 **Engineering Intern** - Internal Combustion (IC) Engine Fitness-for-Service Research

- Completed Al alloy characterization at Lund Institute, evaluating next gen IC engine material by tensile and fatigue analysis.
- Employed fractography methods; collected precipitation-strengthened Al alloy fracture data; defined ductility and toughness.
- Conducted acoustic emission testing with tensile tests, aiding in understanding deformation in pre-elastic limit.

Sep.'18 — Apr.'18 **Engineering Intern** - Battery Innovation Project Assistant

- 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 to extend battery life.

Education

May '20 — May.'24 **Ph. D. in Mechanical Engineering** - University of British Columbia (Expected Completion: End of May 2024)

- Dissertation: "Stress Characterization for Friction-Stir-Welded Hybrid Electric Battery Trays with Application of Neutron Diffraction"

Sep.'16 — Apr.'20 **BASc in Mechanical Engineering** - University of British Columbia

- GPA: 3.9 / 4.0 with Distinction.
- Courses: Applied Machine Learning, Alternative Energy Systems, Heat Transfer Applications, Microelectromechanical Systems, Mechanics of Materials, Robot Modelling and Control, and Manufacturing Processes.

Skills

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