# Brandon Alexander Miller

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## Education

Tennessee Technological University — Cookeville, Tennessee
Master of Science in Mechanical Engineering (Thesis Option) — December 2021
Thesis Title: *Investigation into Machine Learning Architectures for Damage Detection and Classification Within Simulated Total Knee Replacement Devices.*
GPA: 3.84

Tennessee Technological University — Cookeville, Tennessee
Bachelor of Science in Mechanical Engineering — May 2019
GPA: 3.64

## Engineering and Research Experience

Oak Ridge National Lab — Oak Ridge, TN
Data Engineer — October 2022 – Present

- Develops solutions for urban systems using machine learning, data-based modeling, and other state-of-the-art computing approaches.
- Designs data extraction, transformation, and loading processes for multiple concurrent projects focused on resource allocation in adverse and extreme circumstances.
- Collaborates with scientists, engineers, and developers to produce data-driven solutions to aid in complex and time-sensitive problems.

Tennessee Technological University — Cookeville, TN
Graduate Assistant — August 2019 – August 2021

- Instructed undergraduate engineering students in a dynamic modeling and controls (DMC) lab course.
- Aided in developing curriculum for the DMC course to overcome challenges presented by COVID-19.
- Produced one conference paper and two submissions to peer-reviewed academic journals.

Indiana University Health Saxony Hospital — Fishers, IN
Research Intern — Summer 2019

- Assisted in conducting a retrospective study to assess correlations between various factors (e.g., patient age, prosthesis size, time post-operation) and physical wear in the femoral head of implanted hip prostheses.
- Analyzed and measured volumetric changes in prosthetic femoral heads due to wear in approximately 600 radiographs taken during postoperative follow-ups.

Oak Ridge National Lab — Oak Ridge, TN
HERE Intern — Summer 2018

- Drafted a valve tag system for the ORNL steam plant.
- Coordinated with engineers, operators, and tradespeople to attain a detailed knowledge of the plant's layout, as well as the functionality of each system component.

## Publications

- Miller, B. A., & Anton, S. R. (2022). Investigation into machine learning with impedance SHM for damage detection and classification within simulated total knee replacements. *Journal of Intelligent Material Systems and Structures*, 1045389X221086668.
- Miller, B. A., & Anton, S. R. (2021, September). Comparison of Classification Machine Learning Algorithms for Damage Detection in Simulated Total Knee Replacements. In *Smart Materials, Adaptive Structures and Intelligent Systems* (Vol. 85499, p. V001T08A010). American Society of Mechanical Engineers.
- Miller, B. A. (2021). *Investigation into Machine Learning Architectures for Damage Detection and Classification Within Simulated Total Knee Replacement Devices* (Master Thesis, Tennessee Technological University).

**Skills:** MATLAB (Advanced); Microsoft Office Suite (Advanced); Python (Intermediate); SQL (Beginner)