

Alexander David Suer

Education

Doctor of Philosophy, Mechanical Engineering, University of Cincinnati, Cincinnati, OH **Expected: May 2026**

- GPA: 3.93/4.00

Bachelor of Science, Mechanical Engineering, University of Cincinnati, Cincinnati, OH **May 2022**

- GPA: 3.80/4.00
- Robotics and Automation Minor

Research

Dr. Xiaodong Jia, Lab for Intelligent Metrology Systems, University of Cincinnati, Cincinnati, OH **May 2022 – Present**

- Created a UNet for artery/vein segmentation of eye fundus images for cardiovascular health risk assessment.
- Refined a transfer learning model for health classification of robot arms.
- Implemented a dynamic time warping based transfer learning methodology for semiconductor manufacturing fault detection.
- Designed and tested transfer learning models augmented with SVM to classify ball bearing health.
- Created a remaining useful life K-nearest neighbors model for jet engines.

Publications

- **A Suer**, X Yang, R Yang, X You, Z Zhang, J Dong (2023). Development of an Autonomous Robotic Snowplow for Residential Use. *ASME International Mechanical Engineering Congress and Exposition*. DOI: 10.1115/IMECE2023-114010
- Y. Su, J. Shi, Y.M. Hsu, D.Y. Ji, **A.D. Suer**, J. Lee (2023). Volumetric nondestructive metrology for 3D semiconductor packaging: A review. *Measurement*. DOI: 10.1016/j.measurement.2023.114065
- T Minami, **A Suer**, P Kundu, S Siahpour, J Lee (2023). Novel ensemble domain adaptation methodology for enhanced multi-class fault diagnosis of highly-connected fleet of assets. *PHM Society Asia-Pacific Conference*. DOI: 10.36001/phmap.2023.v4i1.3701
- Taco, J., P. Gore, T. Minami, P. Kundu, **A. Suer**, J. Lee (2022). A Novel Methodology for Health Assessment in Printed Circuit Boards. *European Conference of the Prognostics and Health Management Society*. DOI:10.36001/phme.2022.v7i1.3373

Work Experience

Software Development Co-op, International TechneGroup, Milford, OH **January – August 2021**

- Wrote new diagnostics for CADIQ, a CAD analysis tool. Designed the diagnostics to be configurable by customers. These diagnostics are python modules that check customers' CAD models for geometric and annotation defects, such as text differences or unwanted Unicode characters in CAD model annotations.
- Implemented code fixes to preexisting diagnostics in CADIQ to improve the accuracy and speed of the modules.
- Designed new menus and improved older ones for the UI of CADIQ. Used the Qt python library to quickly add the new menus and lists.

R&D Co-op, SETCO Sales Company, Cincinnati, OH **September - December 2018, May – August 2019**

- Created 3D models of new spindle parts. Tested designs under theoretical operating conditions with FEA. Accepted or rejected designs for prototyping based on whether they achieved design requirements.
- Constructed and conducted endurance tests on new products by connecting sensors to custom control circuits and measuring coolant flowrate and product temperature data. Rejected product designs if temperature and flowrate were outside criteria.
- Drafted part and assembly AutoCAD drawings of new products using ISO standards. Drawings of parts were sent to manufacturers for production.

Software Developer, P&G Digital Accelerator, Cincinnati, OH **May – August 2018, January - May 2019**

- Created an ASP.NET web application with Qualtrics' APIs that generates P&G consumer product review surveys.
- Constructed an Android application for perfume chemists to edit perfume recipes. The app will be used by chemists for formula changes while traveling or in laboratories. Programmed the app's flexible internal SQLite database to store new and unusual recipes along with standard formulas. Designed the app's user interface.

Activities

Treasurer, UC Robotics Team, UC, Cincinnati, OH **October 2017 – December 2022**

- Designed and programmed a 3D model of the robot in SolidWorks for simulation in Gazebo to expedite the fine tuning of the robot's navigation stack.

- Developed a ROS node for object detection with computer vision. Node undistorts the robot's fisheye cameras and detects objects through color thresholding. By removing the curvature in a wide-angle image, the robot can measure distances with the camera.
- Designed and assembled robot snowplow's electronics panels.

Member, *Engineers without Borders, UC, Cincinnati, OH*

March 2020 – Present

- Planned additions to the sanitary system of the Tanzanian village Nyambogo. Estimated pipeline flow, and made drawings of pipe network around the system's water tanks.

Skills

- **Programming:** Proficient in Python, MATLAB, Java, C#, ROS, LabVIEW, and Qt.

Awards

- Rindsberg Fellowship, National Merit, and Cincinnati Excellence Scholarships Recipient