William M. Culhane

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EDUCATION

Montana State University — Honors College May 2024

- B.S. Chemical Engineering & B.S. Computer Engineering GPA: 3.86
- Organizations: Tau Beta Pi, Running Club (Vice President, Treasurer)
- Coursework: Photovoltaic Systems, SoC FPGAs, Process Dynamics and Control, Honors Economics, Operating Systems, Networks, Laser Engineering
- Passed FE Exam in April 2023

EXPERIENCE

Texas Instruments May 2023 — August 2023

Quality Engineering Intern — Failure Analysis

- Developed operating parameters for an ion mill to efficiently cross-section devices assembled using different manufacturing processes and characterized resulting cross-sections
- Verified, isolated and characterized device failures in a variety of analog devices

Montana State University August 2022 — May 2024

Teaching Assistant for SoC FPGAs: Hardware/Software Codesign & Custom Computing

- Provided guidance to students in debugging software and hardware issues encountered while working through open-ended FPGA lab assignments
- Answered questions about student projects and lab assignments, specifically focused on VHDL and Linux device driver programming
- Assessed student submissions, evaluating the quality and correctness of work, providing constructive feedback, and contributing to the continuous improvement of the course content

Chang Soft Matter and Microfluidics Lab September 2021 — December 2022

Undergraduate Researcher

- Designed masks for microfluidic devices in AutoCAD and fabricated device molds using a photolithographic process in the Montana Microfabrication Facility
- Assembled and tested multilayer microfluidic devices in a Biosafety Level 2 environment
- Designed and assembled a solenoid driver circuit to interface with microfluidic devices
- Programmed a microcontroller to actuate solenoid valves for remote sampling of bioreactor effluent

PROJECTS

Bacterial Colony-Picking Robot August 2023 — May 2024

- Designed, built and tested a robotic system for sampling bacterial colonies in a microbiology lab
- Programmed and optimized control software to achieve sub-millimeter positioning accuracy, ensuring colony-picking functionality with greater than 95.5 % positioning reliability
- Integrated motor articulation components into the complete system by working collaboratively with other members of the design team

Redesign of Electroplating Wastewater Treatment System for Applied Materials August 2022 — May 2023

- Collaborated with 5-member team to analyze and design process improvements to increase system capacity, reduce operators' exposure to hazards and reduce operating costs
- Assessed the effectiveness, feasibility and profitability of all individual proposed design improvements and compared these results with Applied Materials' existing process

Solar Cell Fabrication January 2022 — May 2022

- Fabricated and diced solar cells in a cleanroom environment
- Measured and characterized cell performance and the impact of fabrication errors on final device performance

AWARDS

Dean's List Fall 2019 — Spring 2024

National Merit Scholar August 2019

- Selected for the National Merit Scholarship as part of top 0.5 % of high school students in the class of 2019, based on standardized test scores, extracurricular achievements and academic performance