Caleb Kartha Bortles

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ACADEMICS:

Michigan State University **East Lansing, MI**

Bachelor of Science in Mechanical Engineering **December 2020**

- GPA: 3.3/4.0. Dean's List: Fall 2020, Spring 2020, Spring 2019
- Mechanical Engineering: Mechatronics, Controls, Product Development, Computational Fluid Dynamics
- Computer Science: Databases, Algorithms & Data Structures, Discrete Structures, Coding in C/C++
- Business Fundamentals: Entrepreneurial Marketing, Business Planning and Modeling

PROJECTS:

Mechatronics, Controls and Electronics Labs **Summer 2019 – Spring 2020**

- Used sensor fusion of multiple sensors to implement PID control of a motorized cart using Simulink, creating a mini-Segway system capable of completing an obstacle course.
- Used a series of control methods to drive an electric motor, compared the efficacy for each method in a series of lab reports. Culminated in the control of a robot's path.
- Completed a set of labs, building circuits programmed with a microcontroller; amplifying, mixing, and rectifying signal waves. Received the highest lab grade in my section.

Computational Fluid Dynamics Projects **Spring 2020**

- Developed solutions of the Navier-Stokes equations in Python for common benchmark problems and improved runtime by utilizing NumPy to replace for loops with stencil operations, increasing the result's detail while running 50 times faster than the previous program. Received a score of 100% and extra credit for the solution.

Product Development Project **Spring 2020**

- Collaborated with a team to design an automated mixing and deposition system capable of combining and depositing a set weight of the mixture for use in a binder jet printing system.
- Led a team of students to complete a full CAD assembly of the design despite different modeling software and shift to virtual work.
- Presented results of design steps to professors, TAs, and class; discussed design choices and integrated feedback from design meetings into our product design.

Business Development Projects **Fall 2020**

- Teamed with four other students to suggest a disruptive business model for a startup by investigating trends within the industry, core competencies, and industry high & low performers to identify the industry's most competitive business model. From the industry and company analysis, worked with team to redesign the startup's business model by applying lessons learned from industry analysis and successful models from other industries. Our group received a score of 97% on the project.

RELEVANT EXPERIENCE:

MSU Technologies, Technology Transfer & Commercialization Office **September 2019- Current**

Technology Commercialization Intern: Conducting screening evaluations of MSU invention disclosures

- Improving screening process by creating a Technology Roadmap to clarify how actions by MSU's inventors and funding from MSUT would lead to the technology's commercialization.
- Collaborating with technology managers to assess emerging technologies from MSU inventors by investigating the academic, market and patent space to determine the market opportunity and potential scope of a patent application. These findings are presented to a multidisciplinary board of professionals in the determination of plan of action, with 8 technologies being advanced for a provisional patent and many receiving additional funding for further investigation.

SKILLS & CERTIFICATIONS:

- **Applications:** MATLAB, Microsoft Office, Simulink, Autodesk Inventor, Siemens NX
- **Manufacturing Tools:** 3D Printer, Mill, Drill Press, Band Saw, Lathe
- **Platforms & Languages:** Python, SQL, R, Amazon AWS EC2, Docker, Jupyter Lab, C++, C, Java, HTML