Ben McAlonie

benmcalonie@gmail.com | 518.785.0385 | benmcalonie.com | linkedin.com/in/benmcalonie

EDUCATION

Rochester Institute of Technology, Rochester, NY. **Expected May 2024**
BS Mechanical Engineering

SKILLS

Software: SolidWorks, Creo, ANSYS, MATLAB, Python, Excel, LabVIEW, C++/Arduino, JMP, Jira, SAP/ECTR
Hardware: Machining, Welding, Injection Molding, 3D Printing, DFM, FMEA, NI DAQ
Team: Agile Methodology, Project Presentation, Collaborative Design, LEAN Six Sigma

EXPERIENCE

Keurig Dr. Pepper, Burlington, MA. **Jan 2023 – Jun 2023**
Mechanical Systems Design Co-op

- Conducted a research initiative to develop a model of a 5-input thermal-fluids system containing water sensors, pumps, heaters, and control boards by collecting data through a custom LabVIEW program and a NI DAQ device
- Built a mathematical model in MATLAB for a pressure release valve, then prototyped it with SolidWorks CAD and SLS 3D printed parts, delivering an assembly that can be directly implemented into production products for lifecycle testing
- Parsed testing data in Python and analyzed it in JMP to determine performance metrics based on input/output configurations
- Optimized a 5W thermoelectric cooling system via an ANSYS simulation, achieving a 120°F reduction of a 12oz water mass in 90s
- Partnered with other engineering teams to integrate multiple fluid clog-mitigation strategies into one product applicable solution

Baker Hughes, Waygate Technologies, Skaneateles, NY. **Jan 2022 – Jun 2022**
Mechanical R&D Co-op

- Owned mechanical design for an articulating 3-axis camera probe by utilizing SolidWorks Simulations, steel machined parts, and fatigue testing, resulting in 25% fewer components used and increased cycle life when compared to the previous version
- Designed and machined an aluminum bracket that integrates a load cell into a servo to measure the lateral force the servo exerts
- Drafted testing protocols based on ISO 21535 standards, then performed and documented results in the internal SAP PLM system
- Prototyped a Nomex probe cooling tube for 600°F+ industrial applications, opening a new use case opportunity for the product

Mack Molding Company, Arlington, VT. **May 2021 – Aug 2021**
Manufacturing Engineering Intern

- Updated price files of 120+ components for a $3 million customer in the life science and scientific instrumentation space
- Helped launch four new plastic injection molding tools into production while applying LEAN principles to minimize downtime
- Worked between external clients and the tool engineering team to ensure manufactured products met drawing GD&T specifications

PROJECTS

SAE Aero (University Performance Team) **Aug 2022 – May 2024**

- Developed control surfaces in Creo Simulate for an autonomous aircraft capable of performing waypoint utility missions
- Worked with the systems integration team to align control servos with the flight computer output signal and power specifications

Floating Wetlands System (Senior Design) **Aug 2023 – May 2024**

- Engineered a biofilter to remove nitrogen pollutants from water bodies through an organic bacterial process, which uses no chemicals or additives to remove pollutants and is 90% cheaper and 30% more efficient than current market options
- Coordinated with clients to create design requirements, then wrote and executed test plans to determine if the system met them

VTOL Delivery Drone (Personal) **Feb 2024 – Present**

- Developed a rotor/fixed wing hybrid aircraft for payload delivery flights up to 40 miles using a takeoff and landing zone of 25ft^2
- Modeled mechanical structure in SolidWorks, then 3D printed the airframe and cargo ejection mechanism
- Utilized CFD to analyze lift-to-drag ratios of the airfoils and FEA simulations to design spars with an appropriate factor of safety

Automated Bio-Nutrient System (Personal) **Oct 2023 – Apr 2024**

- Designed mechanical structure that grows vegetables using a liquid nutrient solution with minimal user input, producing the same amount of food a typical soil 250 square foot garden grows in only 10 square feet over a 12-month long operating cycle
- Coded a C++ based feedback algorithm on an Arduino board to control fluid levels and flow cycles via pumps, water sensors, and solenoid valves that can detect and react to system errors while communicating them to the user