

Brayden K. Scarlett

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Education

Bachelor of Science in Engineering, Mechatronics Emphasis

University of Southern Indiana, Evansville | GPA: 3.06

Graduation: Fall 2021

Experience

-Research and Development Engineer

University of California, Berkeley – Khanna Lab

January 2025

As part of Dr. Khanna's Sensorimotor Neural Engineering Lab, I leverage my background as a mechatronics engineer to design, prototype, and develop fixtures and devices to contribute to ongoing research projects.

-R&D Prototype Engineer

iota Biosciences, Inc.

August 2022 – November 2024

Under the Engineering R&D department, I leveraged my mechatronics background to conceptualize, develop, and prototype devices, and phantoms, and testing fixtures to contribute to the development of key products, including Class 3 implants and ultrasound technology, including Class 3 implants and ultrasound technology.

- Successfully conceptualized, designed, and developed a specialized novel pressure-sensing device, leading to a new sensing application and resulting in a patent. Patent is currently being processed.
- Successfully conceptualized, designed, and developed custom compliant mechanism pliers for manipulating key product PCBs in a manufacturing environment utilizing FEA.
- Contributed to the design, development, and application of a 3DOF linear actuating gantry system and 2DOF rotary actuator to simulate interior anatomical motion.
- Successfully conceptualized, designed, and developed a 3DOF lift and platform for precise positional and speed control for simulation of anatomical motion while submerged in a fluid.
- Successfully designed and developed an automated thermography fixture for imaging and analyzing the thermal characteristics of PCBs, ASICs, and piezos.
- Contributed to the root cause failure analysis of proprietary ASICs and PCBs via assessing the effect of thermal stresses on ASIC and PCB architecture.
- Successfully conceptualized, designed, and developed a PID controlled heating system with minimal modification of existing water tank for simulating interior anatomical temperatures in a large volume water tank.
- Contributed to the root cause failure analysis of medical implants via assessing the effect of fixture tolerancing on sensor calibration, and creating an autonomous testing fixture for continuous testing and characterization of sensor functionality.
- Ensured the first successful acquisition of In Vivo subject data by designing, constructing, and operating the testing fixture and data collection system for In Vivo and Ex Vivo studies assessing implant functionality and feasibility.
- Conducted, and automated, thermal design verification testing (DVT) of medical implants in accordance with ISO standards.
- Successfully conceptualized, designed, and developed tunable passive geometric focusing acoustic lenses for ultrasound applications, increasing product performance and precision.

Key Skills

- Proficient in *Python, SolidWorks, Rapid Prototyping, Fixture Design, and Office 360*
- Intermediate experience in *Control Systems Design [Thermal and Motion Controls] (Linear Control), Embedded Systems, Electric Machines/Motors, C, C++, MATLAB, Multisim, Compliant Mechanism Design, Finite Element Analysis [FEA] (SolidWorks and MATLAB), AutoCAD, 3D Printing (FDM and SLA), and Clean Rooms [Ex Vivo and In Vivo]*
- Junior experience in *Robotics, Electronics, PCB Design (Altium), CNC Manufacturing [Aluminum and Steel], Computer Vision [Thermography] (OpenCV), and Acoustic Engineering [Ultrasound]*
- Strong analytical skills, detail oriented, results driven, adaptable, and a self-starter

Publications

-Sensing externally applied pressure through a conformal spacer and integrated pressure sensor

- A novel pressure sensing device and sensing application for sensing and measuring applied pressure to a soft bodied object and estimating internal pressure of said object. Patent is currently being processed.

Projects

- 2DOF ball balancer utilizing a touchscreen display for positional control of ball and a cascaded PID with feedforward for control of position, velocity, and acceleration of motors. (In progress)
- Impedance controlled haptic-feedback system for remotely controlled robotic manipulators utilizing FOC (Field Oriented Control) and SEA (Series Elastic Actuator) design. (In progress)

Extracurriculars

- IEEE – Southeast Hardware Competition – Robotics Team August 2018 – August 2020