

SOFIA HANDZY

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EDUCATION

Northeastern University - Boston, MA May 2025

M.S. in Mechanical Engineering, Concentration in Robotics GPA: 3.92

B.S. in Mechanical Engineering, Minors in Mathematics & Religious Studies GPA: 3.83

Coursework: Control Systems, Mechatronic Systems, Robot Science and Systems, Mobile Robotics, Mechanical Design, Mechanics of Materials, Computation & Design, Heat Transfer, Fluid Dynamics, Dynamics

Honors and Awards: Dean's List (All Semesters), Dean's Connections Scholarship Recipient, Ukrainian Aviation and Maritime Eagle Scout

Activities: Students for the Exploration and Development of Space (SEDS), VP of Theme Park Engineering Club, American Society of Mechanical Engineers

SKILLS

Software: SolidWorks CSWA (Surfacing, FEA, Solid Modeling), OnShape, Fusion 360, AutoCAD, 3D Printing (FDM/SLA), MS Office Suite, Arduino, MATLAB (Simulink + Simscape), Python (basic), C++ (basic)

Equipment: Soldering, Laser Cutting, Metal Stamping, Standard Shop Tools

PROFESSIONAL EXPERIENCE

Hasbro | Animatronics Engineering Co-Op | Pawtucket, RI July - Dec. 2023

- Authored NulDE and Audacity scripts to program servo motors for synchronous audio and motion
- Led electrical component selection, assembly, and testing of PCB's including components like resistors, headers, lights, and switches for toy animation with a focus on design for production and cost savings
- Designed dynamic toy elements in Solidworks (100+ hours) with gear trains, 4-bar linkages, and springs to incorporate movement in animated toys
- Machined parts for toys using standard shop tools such as a lathe, mill, drill press, and sander

Epicore Biosystems | Mechanical Engineering Co-Op | Cambridge, MA July - Dec. 2022

- Designed a waterproofing test procedure by IPX4 Standards to subject units to water submersion and exposure at 50-150 kPa to dictate areas of improvement for product redesign
- Authored and tested a manufacturing procedure utilized for refurbishing over 60 Connected Hydration Devices to check PCB function and replace faulty housings and gaskets
- Optimized post-processing Python scripts for on-body unit tests, reducing analysis time by 96%
- Developed a software analysis protocol and soldered resistors and potentiometers onto a custom PCB to indicate proper fluid flow on the fluidic

PROJECTS/ACTIVITIES

Crochet Machine, Masters Thesis Project Sept. 2024 - April 2025

- Designed, built, and programmed an automated crochet machine that creates a chain stitch autonomously using a three part system (crocheter, tensioner, and holder) using 8020 aluminum framing, servo motors, DC motors, and 3D printed PLA parts
- Created custom motor-driven hook actuation using a rack-and-pinion system and motorized tension control for precise yarn feeding
- Implemented MATLAB-based pattern generator for estimating project sizes and enabling chain length, hook size, and yarn type adjustments
- Conducted motion capture experiments to analyze human crochet motion, informing design kinematics
- Integrated open-loop motion control for linear and rotational actuation, achieving a proof-of-concept for reliable chain stitch formation

ErgPAL, Senior Year Capstone Project May 2023 - May 2024

- Designed and prototyped a rowing machine accessory that uses a rotating eccentric mass to mimic the physical impulse cues of in-boat rowing, helping athletes train solo for better synchronization
- Programmed an ESP-32 microcontroller to send PWM signals to a brushless DC motor with a custom control system, integrating ultrasonic sensors for positional accuracy
- Soldered the electrical system with a Spark MAX motor controller, emergency stop button, potentiometer for stroke rate adjustment, and LED status indicator
- Conducted iterative tests and analysis to optimize impulse forces and motor dynamics