Benedek Gyuris

+1 845-297-1690 | Bence@gyuris.com
https://www.linkedin.com/in/benedekgyuris/

PERSONAL INFORMATION

Born in Poughkeepsie, NY on January 3rd, 2000.
Citizenships: United States of America, Hungarian

PROFESSIONAL SUMMARY

Versatile and solutions-oriented mechanical engineer with a strong foundation in biomedical systems, specializing in control theory, robotics, and automation. Experienced in developing real-world hardware solutions through hands-on prototyping, additive manufacturing, and mechatronic system integration. Demonstrated leadership in interdisciplinary teams, with successful contributions to assistive device development, embedded control systems, and dynamic simulation. Proficient in SolidWorks, MATLAB, Python (OpenCV), and microcontroller programming (Arduino). Passionate about applying engineering to complex, cross-disciplinary problems in marine robotics, automation, and rehabilitation technology. Seeking to contribute technical depth, creativity, and collaborative drive to an innovative engineering team.

EDUCATION

Master of Science in Mechanical Engineering
Tufts University, Medford, MA
Graduated December 2024

Bachelor of Science in Biomedical Engineering
Boston University, Boston, MA
Graduated May 2023

SKILLS

Technical - SolidWorks, COMSOL, MATLAB, Python-openCV, Arduino, Robotic Systems, Control Theory(PID, Impedance), C, Microsoft Office Suite Language - English(Native), Hungarian(Native), Spanish(Proficient)

PROJECT EXPERIENCE

Tilting Table Rehabilitation System
Master's Thesis Project | Tufts University | June 2024 – December 2024

- Designed a gravity-based robotic system for stroke therapy with dynamic impedance control for upper-limb rehabilitation.
- Utilized MATLAB state-space modeling and ode45 for system simulation, achieving optimized system damping with PD control.
- Developed positional tracking in Python with OpenCV and integrated Arduino for motor control.
- Worked with Dr. Felix Huang to conceptualize a low-cost, adaptable therapy device for home-based care.

Pneumatically Powered Self-Leveling Table
Printable Soft Robotics Course Project | September 2024 – December 2024

- Designed a table powered by 3D-printed TPU linear actuators for remote drone landings.
- Configured Arduino microcontroller to control solenoid valves, enabling precise actuator inflation/deflation.
- Troubleshooted and optimized a Prusa Mini 3D printer, developing expertise in slicer settings and TPU material handling.
- Used COMSOL to simulate the extension of linear actuators before manufacturing.

REFLEX: A Stroke Rehabilitation Device
Tufts IDEA Human Factors Lab | January 2024 – December 2024

- Designed and prototyped low-fidelity attachments for forearm and bicep components to assist stroke patients.
- Collaborated in a multidisciplinary team of Human Factors and Mechanical Engineers, addressing user-centered design challenges.
- Conducted SolidWorks workshops for new lab members and mentored undergraduate and graduate team members.
- Applied additive manufacturing techniques to assemble the prototype, gaining insights into rapid prototyping.

Standing Cello Holder
Tufts University | January 2024 – May 2024

- Collaborated with a client to design a user-friendly casing for an infrared thermometer, incorporating feedback into iterative designs.
- Used SolidWorks to create accessible and ergonomic features tailored for individuals with autism and Down syndrome.
- Assembled a functional prototype using a protoboard, demonstrating proficiency in component selection, circuit layout, and soldering, and integrating sensors with a microcontroller to validate early-stage electronics in a user-facing device.

3LPlace: Adjusting Consumption Behavior
Tufts University | January 2024 – May 2024

- Collaborated with a client to design a user-friendly casing for an infrared thermometer, incorporating feedback into iterative designs.
- Used SolidWorks to create accessible and ergonomic features tailored for individuals with autism and Down syndrome.
- Assembled a functional prototype using a protoboard, demonstrating proficiency in component selection, circuit layout, and soldering, and integrating sensors with a microcontroller to validate early-stage electronics in a user-facing device.

Cancer Drug Development Microfluidic Platform
DRAPER | October 2022 – June 2023

- Increased throughput by 400% through novel design optimization for tumor model testing.
- Designed and implemented a tumor-loading protocol for parallel biological validation using carcinoma cell lines.

Customizable Wheelchair Cushion
BMES MINDS Scholar Program | October 2022 – May 2023

- Led a virtual collaboration to develop a device that prevents pressure ulcers in wheelchair users.
- Focused on commercialization strategies, regulatory compliance, and intellectual property protection.
- **Presented this work at the 2023 BMES Annual Meeting**.

WORK EXPERIENCE

Administrative Assistant/Insurance Specialist
Newton Pediatrics | Wellesley, MA | December 2015 – December 2023

- Provided exceptional customer service, greeting and assisting patients, and showcasing strong interpersonal skills.
- Managed administrative tasks, including handling payments, registrations, and referrals while ensuring patients' insurance compliance.
- Collaborated with providers to streamline patient care and maintain efficient office operations.

Landscaping Planner
Wellesley, MA | May 2022 – August 2022

- Researched and implemented methods for developing effective drainage systems.
- Hired and supervised five employees, coordinating daily activities for landscaping projects.
- Budgeted and recorded expenses, applying strong organizational and administrative skills.

RESEARCH EXPERIENCE

Research Assistant
Northeastern University | Boston, MA | May 2025 – Present

- Simulated decentralized swarm behaviors in a C-based Kilobot simulator to evaluate emergent network dynamics and communication constraints.
- Designed experiments to validate network assembly protocols and compare simulation results with physical robot behaviors.
- Built and deployed a 20-robot Kilobot swarm by reviewing PCB designs in KiCAD and Altium, ordering custom electronics, and completing hardware assembly using a pick-and-place machine and reflow soldering.

Research Assistant
Harvard University | Cambridge, MA | March 2024 – August 2024

- Conducted breeding and egg collection of zebrafish to study environmental pollution's effects on reflex development.
- Simulated polluted environmental conditions to analyze their impact on zebrafish embryos.
- Investigated neural development disruptions caused by pollutants, collecting data using a testing rig which visually tracked the position and direction of specimens.

Lab Assistant
Semmelweis University | Budapest, Hungary | April 2019 – August 2019

- Dissected chicken embryos and isolated the lower GI tract to track stem cell migration during development.
- Prepared cross-sectional slides using a cryostat and applied fluorescent dyes for imaging.
- Conducted detailed analysis of embryonic stem cell movement using confocal and fluorescent microscopy.

ACTIVITIES AND LEADERSHIP EXPERIENCE

Hungarian Scouting Association
Camp Organizer/Leader | November 2019 – Present

- Organized multi-day activities for groups of 10–20 members, promoting leadership and collaboration.

Phi Sigma Pi National Honors Fraternity
Alumni Committee Head | November 2019 – May 2020

- Maintained and organized alumni contacts and co-op resources for active members.
- Budgeted and planned an alumni banquet for over 45 attendees, coordinating with vendors and managing event logistics.

AWARDS

MINDS Elite Scholar Recognition, Biomedical Engineering Society - 2023

HOBBIES AND INTERESTS

Hobbies & Interests

- **Mountain Climbing & Hiking:**
  Passionate about the outdoors, I've spent the past two years climbing some of New Hampshire's tallest peaks. This hobby reflects my drive, resilience, and commitment to tackling challenging environments.
- **Marine Exploration:**
  I got my scuba diving Open Water certification 10 years ago and have gone on two dozen dives during which I was able to appreciate the beauty and complexity of underwater environments. I was also able to take an elective Oceanography course at Boston University which expanded my knowledge of marine ecosystems as well as the potential research to be done.
- **Vintage Music & Restoration:**
  A dedicated vintage music enthusiast, I restored my grandfather's record player for use in the U.S. I enjoy exploring local record stores to discover hidden musical treasures, an activity that combines my appreciation for history with technical problem-solving.

- **Creative Craftsmanship:**
  I enjoy exploring creative projects, such as mastering the embroidery function on a sewing machine at Tufts University to create personalized gifts. This hands-on experience has honed my attention to detail.
- **Community Engagement & Leadership:**
  As an active member of the Hungarian Scouting Association (KMCSSZ), I organize weekend camps and team-building activities for groups of 10–20 members. This role has strengthened my leadership, organizational, and interpersonal skills.