Matthew Q. Gothard

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Education

Vanderbilt University | Nashville, TN *January 2017 – May 2021*
Bachelor of Engineering in Mechanical Engineering, GPA 3.69

Trinity College Dublin | Dublin, IE *January 2020 – April 2020*
Visiting student with 14 Credit Hours, GPA 3.92

Skills

Programming: Python, C++, MATLAB, Linux, Git
Design: CAD, GD&T, DFMA, PCB Design
Manufacturing: Manual Mill, Lathe, Bandsaw, Drill Press, CNC Router, Laser Cutter, SLA, SLS, FFF 3D printers

Experience

Paperless Parts | Boston, MA *October 2021 – Present*
Technical Implementation Specialist / Software Engineering Team

- Developing custom logic in Python to automate the quoting process for over 15 CNC and fabrication job shops based on geometric-driven DFM warnings and runtime estimations
- Coding custom scripts which interact with the Paperless Parts API to import, export, and visualize user data

NASA Marshall Space Flight Center | Huntsville, AL *June 2020 – August 2020*
Research and Development Engineering Intern / Advanced Concepts Office

- Created prototypes and testing protocols for the development of the Correlated Electromagnetic Levitation Actuator
- Designed compliant probe mounted on a 6-axis robotic arm capable of manufacturing custom correlated magnetics
- Wrote technical reports compiling research and informing agile development benchmarks

Formlabs | Durham, NC *June 2019 – August 2019*
Mechanical Engineering Intern / Research and Development Office

- Assembled, scripted, and automated data visualization for a jig which streamlined hundreds of repeated trials to inform design choices for the recently released Build Platform 2
- Designed, built, and coded a fixture to dimensionally calibrate the Form 3 SLA 3D printer during production

Selected Projects *www.mattmakes.xyz*

Handwritten Digital Circuit Simulator *October 2021 – January 2022*
Developed a Python program to directly simulate handwritten digital circuit diagrams as an individual project

- Created a digital logic simulation which reliably propagates logic interactively across handwritten images using OpenCV
- Trained a TensorFlow model to predict the corresponding logic item from handwritten digital logic representations

Lego Pick and Place Machine *April 2021 – May 2021*
Built a 3-axis motion platform capable of placing user-defined Lego designs in 3 weeks as an individual project for mechatronics class

- Implemented Grbl-controlled ESP32 to drive stepper-motors on a custom XYZ gantry capable of placing 1x1 Lego bricks
- Built a Python program to convert a built Lego CAD model into G-code

4-DOF Continuum-Robotic Elephant Trunk *August 2020 – April 2021*
Developed a 20-DOF animatronic robotic elephant for the Nashville Zoo as a team of 4 senior design students

- Designed and manufactured a 2-stage robot capable of emulating the arc-like movements of an elephant's trunk
- Utilized Raspberry PI and OpenCV to detect human presence and inform trunk movement along custom-animated paths

Activities

Sybbure Searle Undergraduate Research Program | Nashville, TN *December 2017 – May 2021*

- Led weekly meetings of undergraduate student researchers to provide mentorship and research feedback
- Generated goals and created prototypes for the senior design project of an electrical-engineering student
- Engaged in multidisciplinary team-based hackathon projects, such as the development of collapsible furniture for dorms

Vanderbilt ArtLab | Nashville, TN *November 2018 – May 2021*

- Developed exhibits for and planned exhibitions which explore the intersection of engineering, science, and art
- Created speaker series which welcomed professors, artists, and creative engineers to share their experiences with the lab