Jake Golden

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Education

Duke University — Pratt School of Engineering | Durham, NC
Aug 2023 - Present

- B.S.E. in Biomedical Engineering & Electrical and Computer Engineering, expected May 2027
- Cumulative GPA: 4.00/4.00

Experience

Product Development Intern | Stryker, Mahwah, NJ
May 2025 - Aug 2025

- Iteratively developed nine prototypes for novel knee replacement implant: created design inputs to address unmet user needs and modeled prototypes in PTC Creo.
- Performed verification tests on 50+ samples to ensure integrity of device packaging.
- Verified geometric tolerancing and dimensioning equivalency to legacy devices.
- Automated surgical template generation (MATLAB/Creo), saving 10+ hours of work.

Computational Neuroscience Researcher | Brain Stimulation Engineering Lab at Duke University Medical Center, Durham, NC
Jan 2024 - Present

- Program finite element analysis (FEA) ECT/TMS brain stimulation models in MATLAB
- Develop automated pipelines (MATLAB/Bash) that integrate MRI processing, mesh generation/processing (4M+ elements), and coil optimization for high-throughput, patient-specific FEA simulations (~50 simulations/week).

Mechanical Engineering Intern | SIMS Pump Valve Company, Hoboken, NJ
Sep 2022 - Jun 2023

- Created ISO-standard CAD models/drawings using surface modeling in SOLIDWORKS.
- Built standardized part library (300+ parts) for efficient modeling in future projects.
- Performed tolerance verification on pump parts using calipers and micrometers.

Biomedical R&D Intern | Stevens Institute of Technology, Hoboken, NJ
Jun 2022 - Sep 2022

- Collected experimental data (100+ samples) to train computer vision model for guidewire shaped-based pressure estimation in mechanical thrombectomy.
- Designed pressure data acquisition system using robotic arm and piezoelectric transducers to measure contact forces to the nearest mN.

Projects | *Visit https://jake-golden.github.io for more*

Steel Ball Dispenser for Lawnmower Testing | UL Solutions, Durham, NC

- Designed and prototyped dispenser system for storing and ejecting 1500+ 0.25-inch steel balls at fixed rate without jamming using turnstile gear.
- Translated user needs into design inputs, conducted brainstorming, and performed failure modes analysis to guide prototyping.
- Designed embedded system to convert potentiometer inputs into controlled gear speeds and vibration frequencies; 3D-printed housing and track components.

PID-Controlled Arduino Self-Balancing Robot | Hackensack, NJ

- Built two-wheeled self-balancing robot using Arduino, sensors, and DC motors; implemented I²C communication with custom PCB and housing.
- Iteratively tuned PID control parameters to achieve stable balancing.

Skills

Programming & Software

Finite element analysis: MATLAB

Automation: MATLAB and Bash

General-purpose: Java, C, Python, R, LaTeX

Engineering

CAD: SOLIDWORKS, PTC Creo, Autodesk Fusion

Circuit prototyping: Arduino programming, breadboarding, debugging with multimeters and oscilloscopes

PCB design and assembly: schematic capture (KiCad, EasyEDA), soldering

Fabrication: 3D printing (FDM), laser cutting

Applied Mathematics

Signal processing: Time/frequency domain analysis, filtering, control systems

Circuit design and analysis: Analog/digital circuits, op-amp circuits, frequency response analysis, Boolean algebra, K-Maps

Wave systems: Phasor and Fourier analysis, transmission line theory, electromagnetic waves

Experimental design: Hypothesis testing, data normalization, inferential statistics

Awards & Honors

Pratt School of Engineering Dean's List with Distinction (2024, 2025)

National Merit Scholar Finalist

Activities & Interests

Equipment manager, Duke University football team

Part-time math tutor

Piano, guitar

Photography

College basketball enthusiast