

Benjamin Chern

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Education

Columbia University

2026

BS in Mechanical Engineering, Minor in Computer Science

- Cumulative GPA: 3.4

Master of Science in Robotics

Expected May 2027

Experience

Incoming Mechanical Engineering Intern, Amsino

June 2026 – August 2026

Mechanical Engineering Intern, Steinway & Sons

May 2025 – August 2025

Designed custom piano parts and fabricated tooling to improve manufacturing and assembly

- Optimized sheet metal manufacturability of a structural pedal box assembly for a \$2.2M piano using Siemens NX
- Designed a custom electromechanical testing fixture using KiCAD and a PLC to reliability test component benches
 - Generated CAM in Fusion360 to manufacture locking mechanism and evaluated results using regression
- Validated complex profile shapes within **0.5 mm** tolerance by designing and fabricating an inspection gauge
- Produced documentation package for shipping sled, including mechanical drawings with detailed **GD&T**

Intern, NASA Research Grant

May 2024 – August 2024

Designed and tested manufacturing solutions for flexible TPU based soft robots

- Fabricated a TPU based compressible endoskeleton capable of extending **3.6x** unactuated length
- 3D modeled and constructed airtight silicone molding around TPU endoskeleton, achieving **1kg** lifted with **5mm** radius
- Developed and constructed a copper stamp for sealing **10µm** TPU sheets in a heat press. Created 3D models in SolidWorks, and machined the stamp using CNC mill to ensure precision
- Implemented control kinematics in Python and created a virtual model of the appendage.

Research, Georgia Tech RoboMed Lab

May 2023 – August 2023

Assembled and programmed tendon controlled endoscope to aid in surgery

- Author on **IEEE** publication, paper presented at 2024 **ISMR** conference
- Saved **\$5,000** by designing and assembling a medical phantom of the femoral artery in Fusion360 to test endoscope maneuverability.
- Wrote user friendly PID controller in C++ which actuates 8 individual motors to **< 1mm** precision
- Created Ethernet shield PCB in EAGLE software to increase serial communication speed of the Raspberry Pi Zero.
- Programmed and integrated wireless input system using Python to control prototype endoscope using Xbox joysticks
- Contacted vendors and performed physical testing to find kink-resistant sub 50 micron tubing for endoscope sheath.

Projects

Self Playing Piano

June 2022 – August 2024

Composed hardware and software to create autonomous piano system capable of playing **any** piece of music

- Individual control over all **88 keys** with **255** degrees of volume modulation using PWM to control solenoid array
- Wrote compact data transmission protocol (**4 bytes per note, 11520 bytes/sec**) to send information over USB serial
- Created static FEA simulation in SolidWorks to determine maximum deformation under weight of solenoids.
- Learned PCB design software KiCad to control PCA9635 PWM chipset over **I2C**
- Documented the results on Youtube and provided assistance to other members attempting the same project

Skills

CAD: Fusion360, SolidWorks, Siemens NX

Hardware: Arduino, Raspberry Pi

Programming: Python, Java, C/C++, MATLAB, C#

Sensors: Temperature, proximity, accelerometers, gyroscopes

Circuit Design & PCB Layout: KiCad, Altium

Fabrication: 3-D Printing (FDM, SLA), CNC Machining, Lathe, Milling, Laser cutting, Soldering