Simon Charles

Mechanism Design | Robotics | Physical AI | Dynamic Systems
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Mechanical engineering researcher interested in intelligent physical systems. I design mechanisms, derive models, and build prototypes that convert energy into controlled motion. My work focuses on dynamics, robotics, and learning-enabled mechanical systems.

EDUCATION

Master of Science in Mechanical Engineering (starting Fall 2026) Sep 2026 – Apr 2028
Brigham Young University - Ira A. Fulton College of Engineering Provo, UT

Bachelor of Science in Mechanical Engineering Sep 2019 – Apr 2026
Brigham Young University - Ira A. Fulton College of Engineering Provo, UT

- Minor: Mathematics
- Cumulative GPA: 3.80

Teaching assistant — Dynamic System Modeling

- Guided students in modeling physical systems using differential equations

RESEARCH

Research Assistant to Dr. Nathan Usevitch June 2024 – Present
Robotic mechanism project involving flywheel energy transfer for planetary exploration. Collaboration with UC Santa Barbara.

- Dynamic system modeling, Python, MATLAB, extensive 3D printing and prototyping
- Experiment design and hypothesis validation
- Mechanical design: stress analysis (FEA), topology optimization, mechanism selection and design

Research Assistant to Dr. Nathan Speirs Jan – April 2024
High speed photography of interfacial fluid dynamics

- Built an acoustic levitator for particle isolation
- Data collection and experimentation with hygroscopic particles and analysis using a high-speed camera

TECHNICAL SKILLS

Dynamic system modeling, Python (NumPy, SciPy, SymPy), MATLAB, dynamic systems, control theory
Hardware, mechanism design, 3D printing, CAD (SolidWorks, Onshape), sensors, microcontrollers (ESP32, PIC24)
FEA, optimization, rapid prototyping, experimental design

LEADERSHIP

Senior Capstone Project

- Team Lead and Design Lead
    - Led daily team efforts to build a precision aerodynamic particle sorting device
    - Worked with industry sponsors to create a desirable and transferable product

Student Clubs

- President – BYU Chapter of the American Society of Mechanical Engineers
    - Organized three annual recruiting dinners for 60+ recruiters and students
    - Established leadership pipeline for continued success
- President – Mindfulness and Meditation Club
    - Doubled club attendance, defined policy and vision, recruited officers

INTERNSHIPS

Sapphire Fountains Sept – Dec 2023

Mechanical Design Assistant and Maintenance Tech

- Built and installed residential, commercial and rental features (worked with pumps, filters, UV systems, chemical controllers, automation control systems, basic plumbing and electrical, solenoid valves, proximity sensors)
- Created SolidWorks parts, assemblies, drawings, and renderings. Fountain component research and selection.

COMPETITIONS

NASA BIG Idea Challenge Jan – Nov 2024

As a team of BYU students, we were selected by NASA to receive $147,000 from a competitive pool of applicants. We built a 5ft inflatable truss robot for the Artemis missions to the moon as part of the BIG Idea annual university challenge.

- Worked in a sub-team of 5 to develop a novel spherical joint and obtained a provisional patent
- 3D modeling and prototyping (25+ iterations of the joint design)
- Tested, researched, and designed space-worthy materials (Kapton, Delrin)

VOLUNTEER SERVICE

Full-Time Representative Seattle, WA, USA & Southern France

Religious Organization July 2020 – July 2022

- Trained 6 new volunteers with 12-week training program. Hundreds of teaching appointments
- Relocated frequently over 2 years. Worked closely with 13 different colleagues, overcame character differences

Head Teacher St. Marc, Haiti

Pathways to English May – June 2019

- Worked independently at an orphanage in Haiti teaching English, math, and science to 15 students aged 5-17, daily for two months. Broke records with an incentive program

ADDITIONAL SKILLS AND HOBBY PROJECTS

- Volunteered as an Associate Editor for the BYU Design Review (Published 2 articles and edited 7)
- English (native)
- French (proficient – 3 years in France)
- Built multiple web apps
- Designed an automated snow cone machine
- Designed a pizza oven with stainless steel sheet metal and venturi burner
- Built a laminar flow nozzle

AWARDS AND HONORS

Mechanical Engineering Student Spotlight: https://www.me.byu.edu/student-spotlight-simon-charles