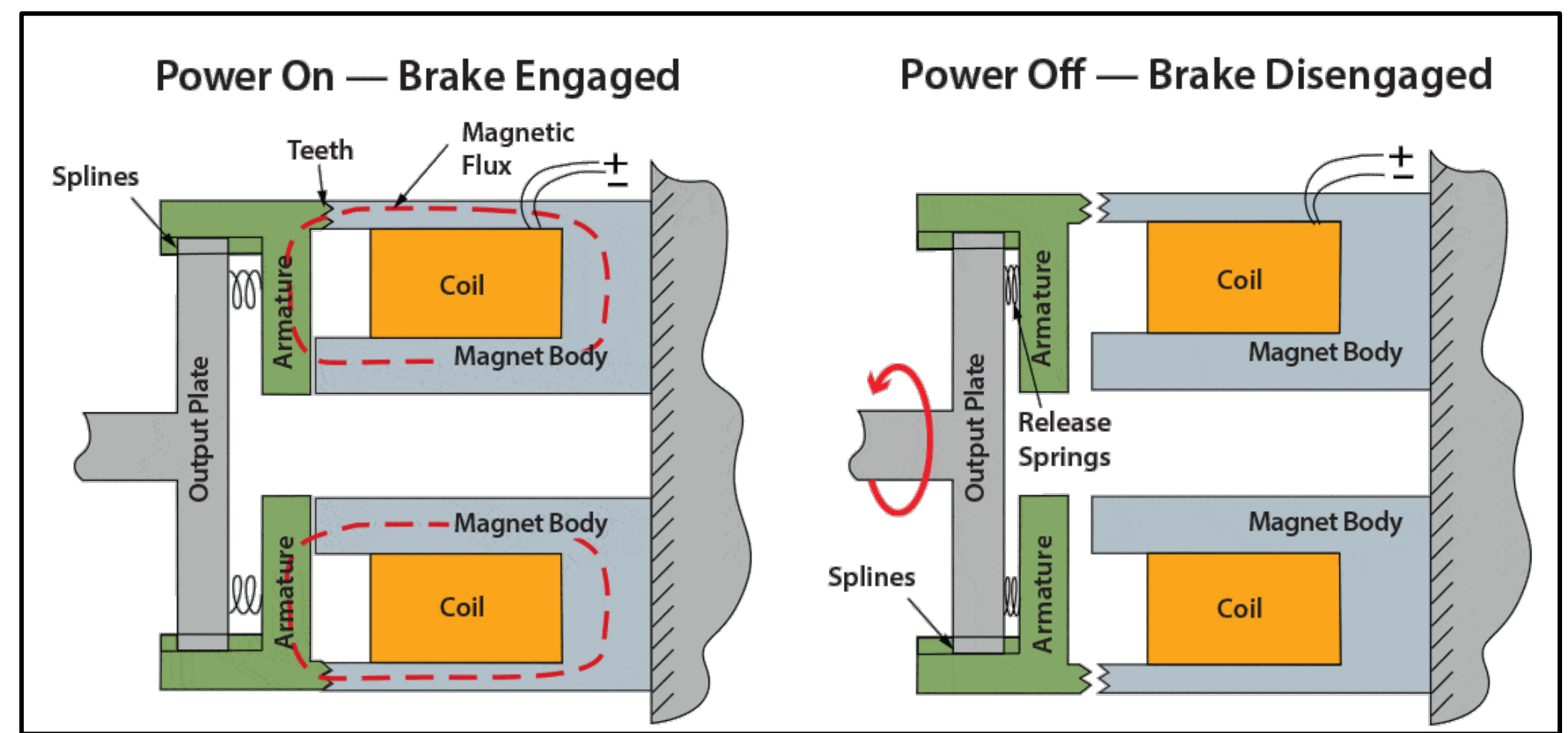


Universal Torque Testing Machine

Develop and prototype a torque and burnishing system for electromagnetic clutches and brakes

Background/ Project Description:

SEPAC is a manufacturer specializing in the production of electromagnetic brakes and clutch systems for a diverse range of applications, extending from medical equipment to aerospace technology. A significant aspect of the assembly process is precision torquing and burnishing of these components. Currently, the production depends on manual assembly, proving to be not only time consuming, but resulting in variances in product construction. Furthermore, burdening the staff to monotonous tasks. SEPAC tasked the group to produce a device that automates both the torque and burnishing process to insure product reliability while improving efficiency.



Electromagnetic Brake Diagram

Deliverables:

Primary:

- Motor Driven Rotation for Burnishing (Bidirectional)
- Adaptable for mounting
- Size: Must fit on existing countertop
- Safety Precautions

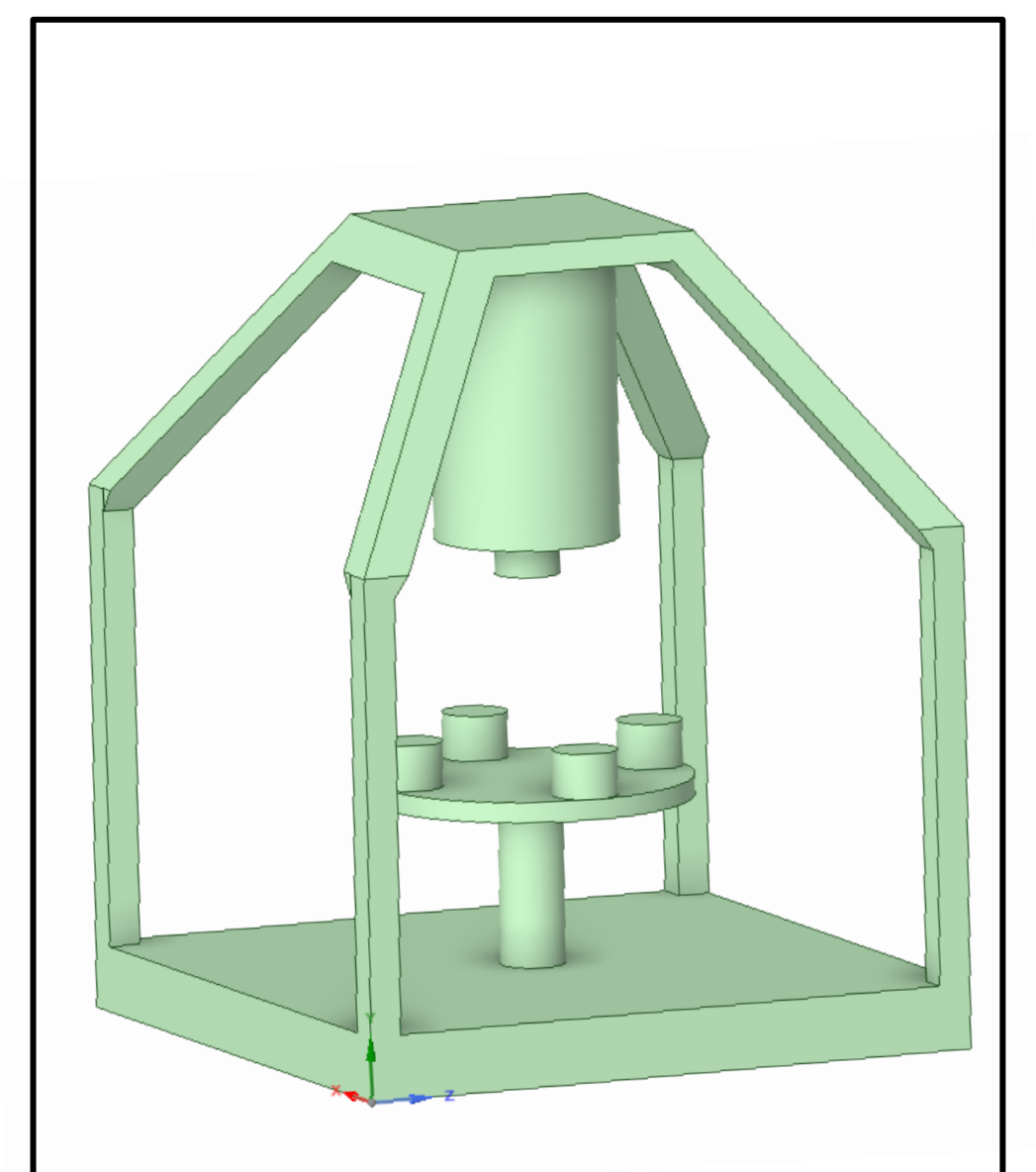
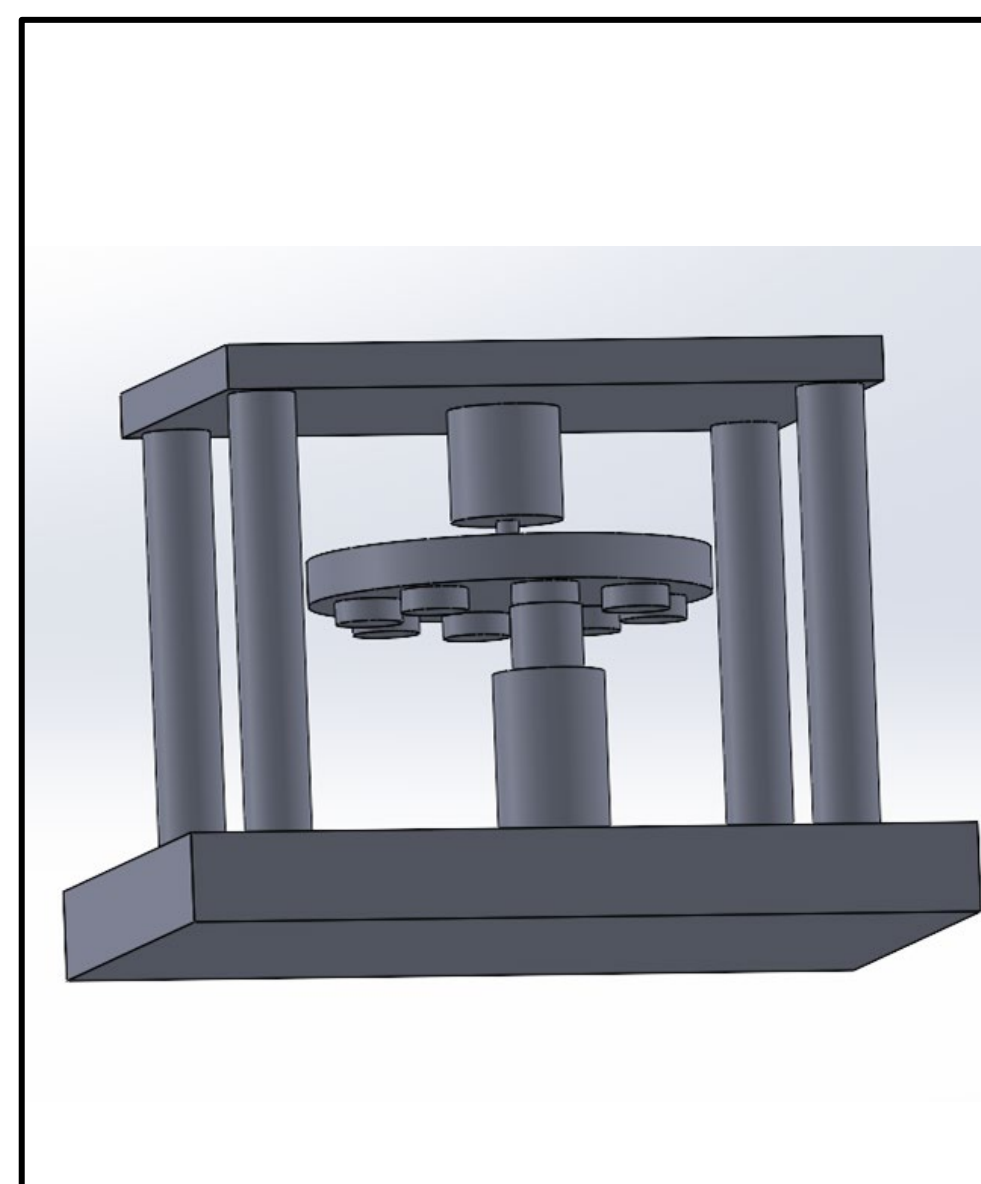
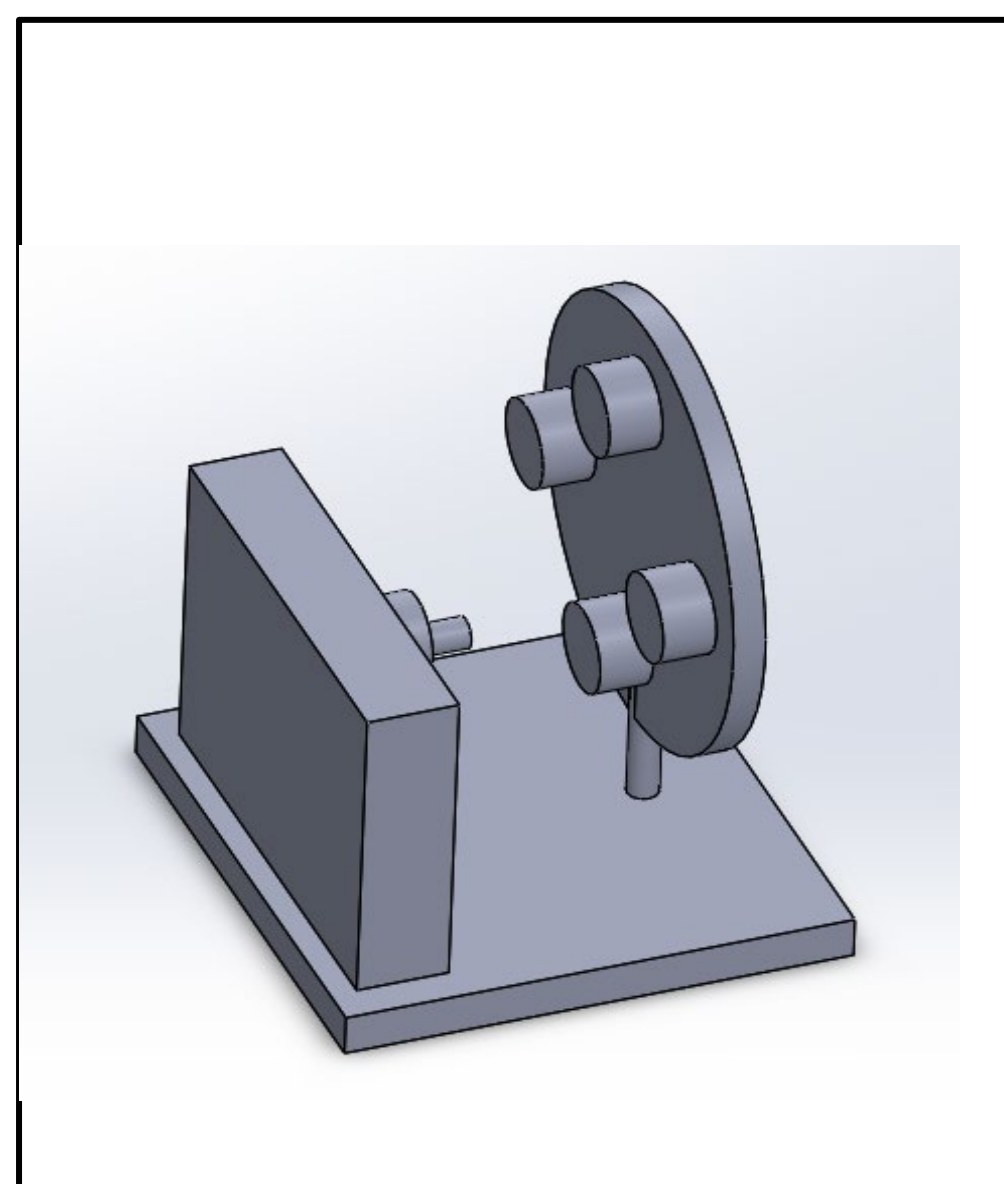
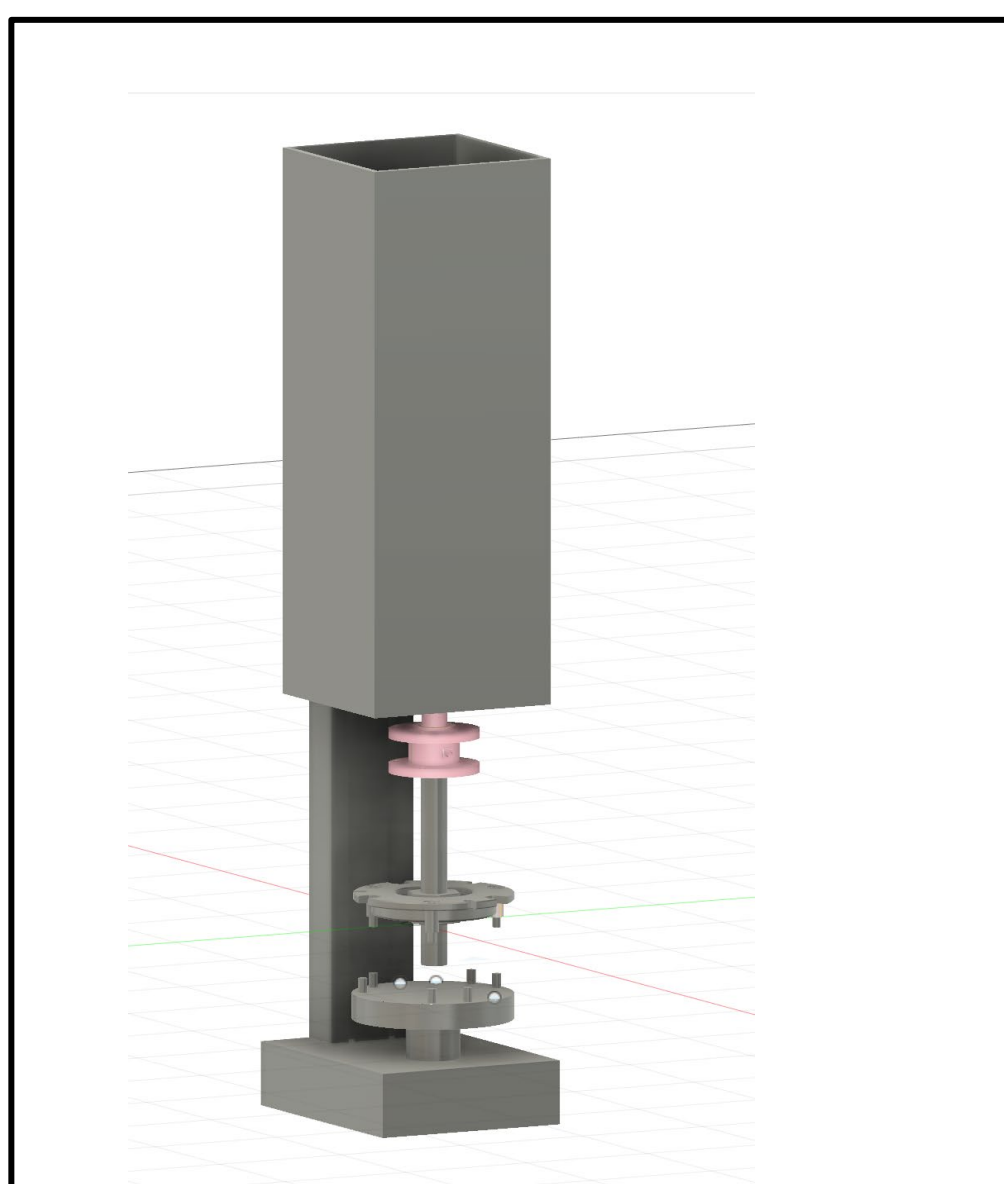
Secondary:

- Automate system to custom burnishing cycles
- Static Torque Measurement
- Air Integration for cooling

Tertiary:

- Automated torque testing
- Data Logging
- Automation of power cycling to brakes during burnishing cycles and torque testing
- Disengage drag torque measurement

Current Design Concepts:



Progress:

Currently we are producing conceptual designs to present to SEPAC for the upcoming week. Subsequent to a site visit to the company, our team has made notable progress after examining SEPAC's current production process. These first hand observations became a strong inspiration for our conceptual designs. Furthermore, the group is actively researching ways to measure static torque, in addition to motor sizing. We hope to finalize our design by the end of the fall semester, including necessary calculations and modeling, so that prototyping and construction can begin upon return for the spring semester.

Our Team:



Mr. Arfeen Armaghan



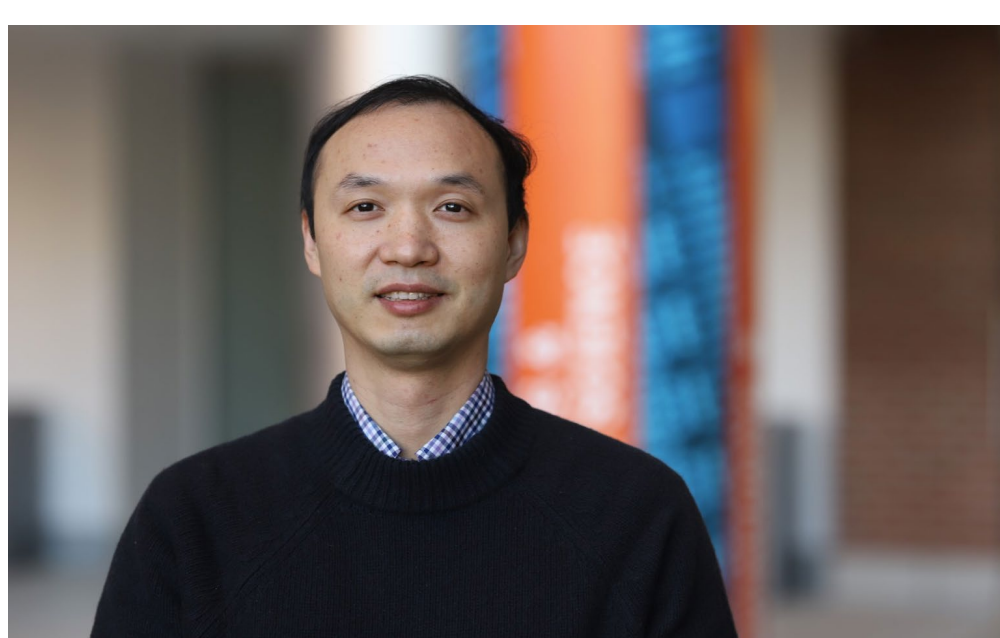
Ms. Rachael Beresford



Mr. Daniel Mack



Mr. Zhihan Zhou



Faculty Advisor:
Prof. Teng Zhang

