

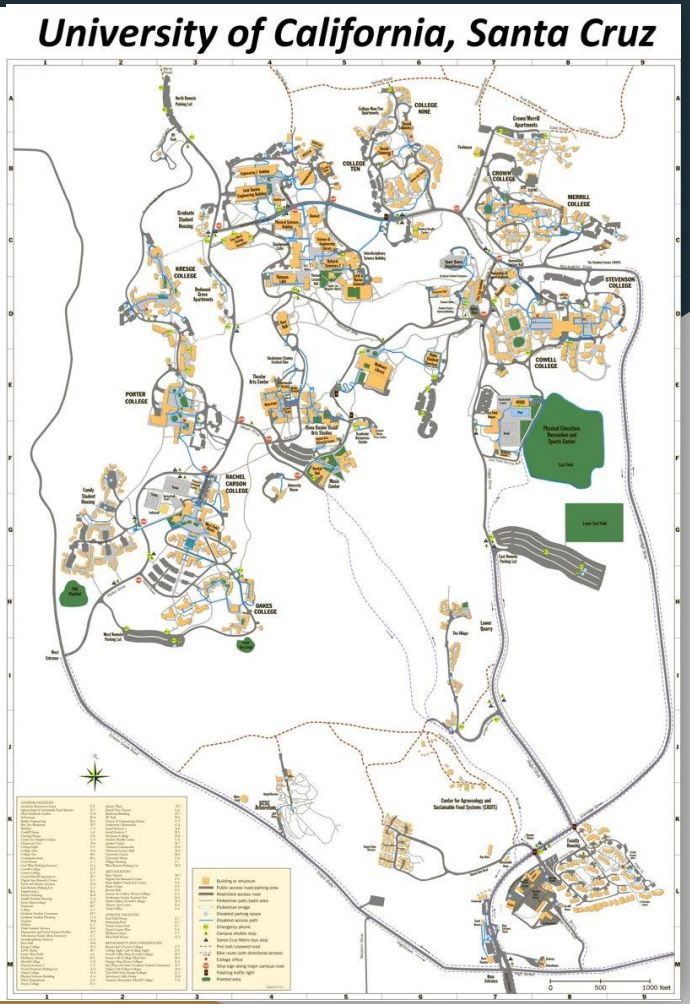

Robotic Cart

UCSC Edition

By Audrey Luan

The Problem - Accessibility

At UCSC, many places are still inaccessible for those who are physically disabled since our campus is mountainous.



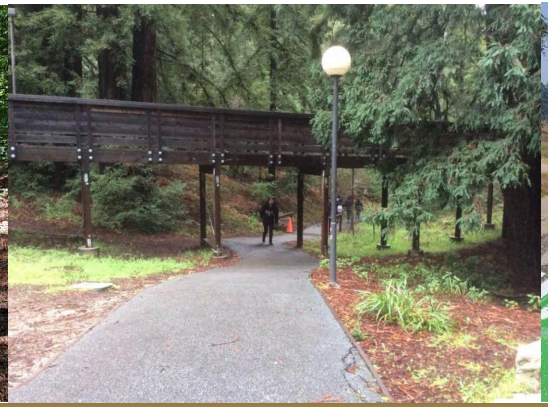
The Problem

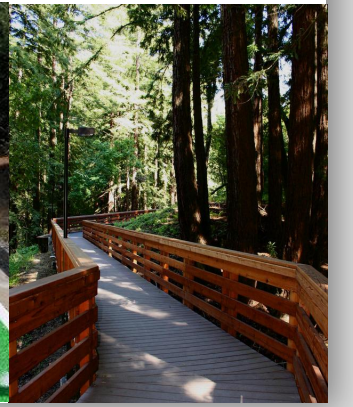
There is a large gap that large vehicles such as cars, loop buses and semi trucks can’t provide on the UCSC campus for moving heavy loads.

Why It Matters - Accessibility

It will allow us to….

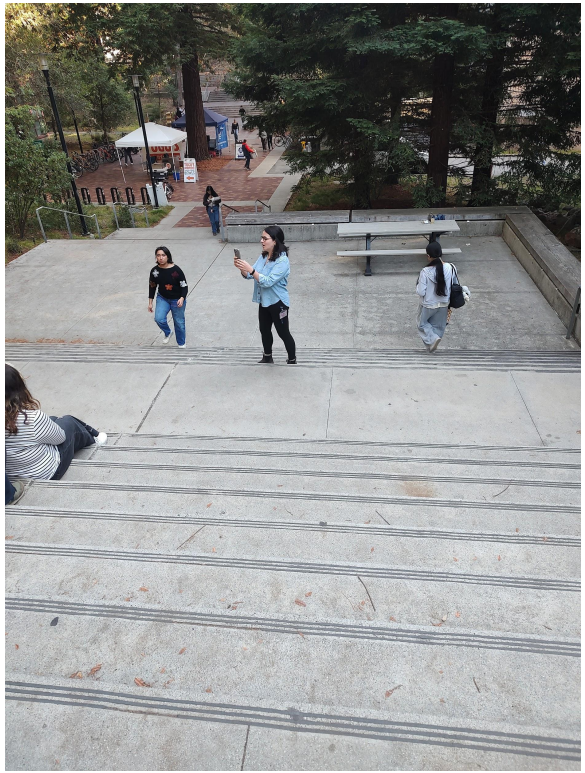
- bring the items we need
- move in / move out of on-campus residences
- go anywhere on-campus





The Problem - Real World Examples

- SAFE rides take a long time to wait.
- Parking for most vehicles are not readily available.
- Public transportation isn't reliable.



Date photos are taken: 4:40PM

The Problem - Real World Examples

Date photos are taken: 4:40PM

The Solution

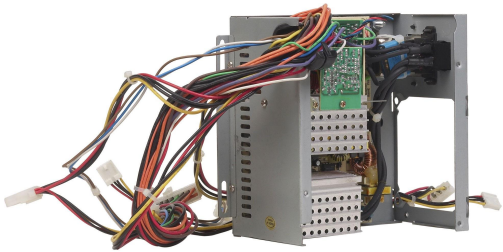
I propose the first version of the robot cart project to solve the problem, for on-campus UCSC students.

Stakeholders and Feedback

- Primary stakeholders: UCSC research institutions, HARE Lab/jlab.
- Secondary stakeholders: University clubs, UCSC faculty.
- Other stakeholders: UCSC students.

Skills needed

- Software
  - Microcontroller programming
  - Firmware documentation & version control (Git)
- Mechanical
  - 3D CAD design (SolidWorks, Onshape, etc.)
  - Chassis design for load support and balance
- Hardware
  - Circuit design and PCB layout
  - Power distribution and integration of microcontrollers



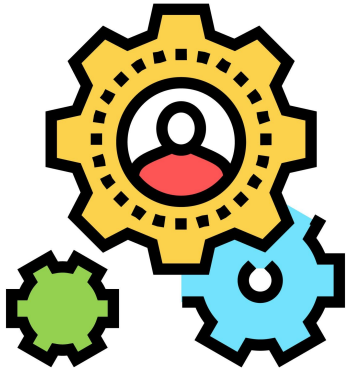
Goals and Success Criteria

- Carrying **25 pounds** of items across **100 feet** without the power board burning out.
- Chassis of robot cart is stable enough to stay in place at an **incline of 25 degrees**.
- Can follow a **specific individual** within **10 feet**.

Goals and Success Criteria

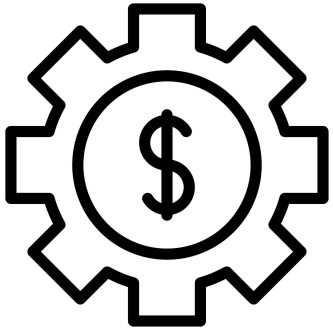
- Splash-proof, doesn’t get damaged in rainy weather.
- Electronics is organized for easy repair, compact.
- A reliable emergency braking system.

Resources and Constraints



Resources:

- Baskin Engineering 3D printers
- BELS
- Amazon



Constraints:

- Maximum weight - **50 pounds**, for scope of CAPSTONE project
- **Cost** of 3D printing filament
- Electrical engineering supplies provided by BELS

How can this be better

Any suggestions on how this project idea can be improved?