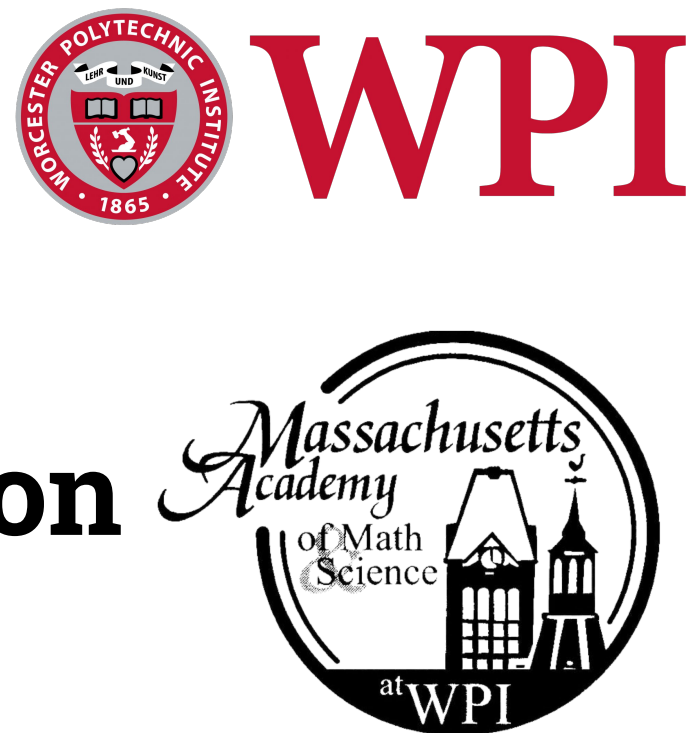




B.U.N.J.E.E.



Balance Utility Navigational Joints with Elastic Expansion

CEO Caroline Walczak, CIO Jianna Bixho, CTO Anthea Sun, & CMO Thomas Giolas
Advisor: Kevin Crowthers, Ph.D.

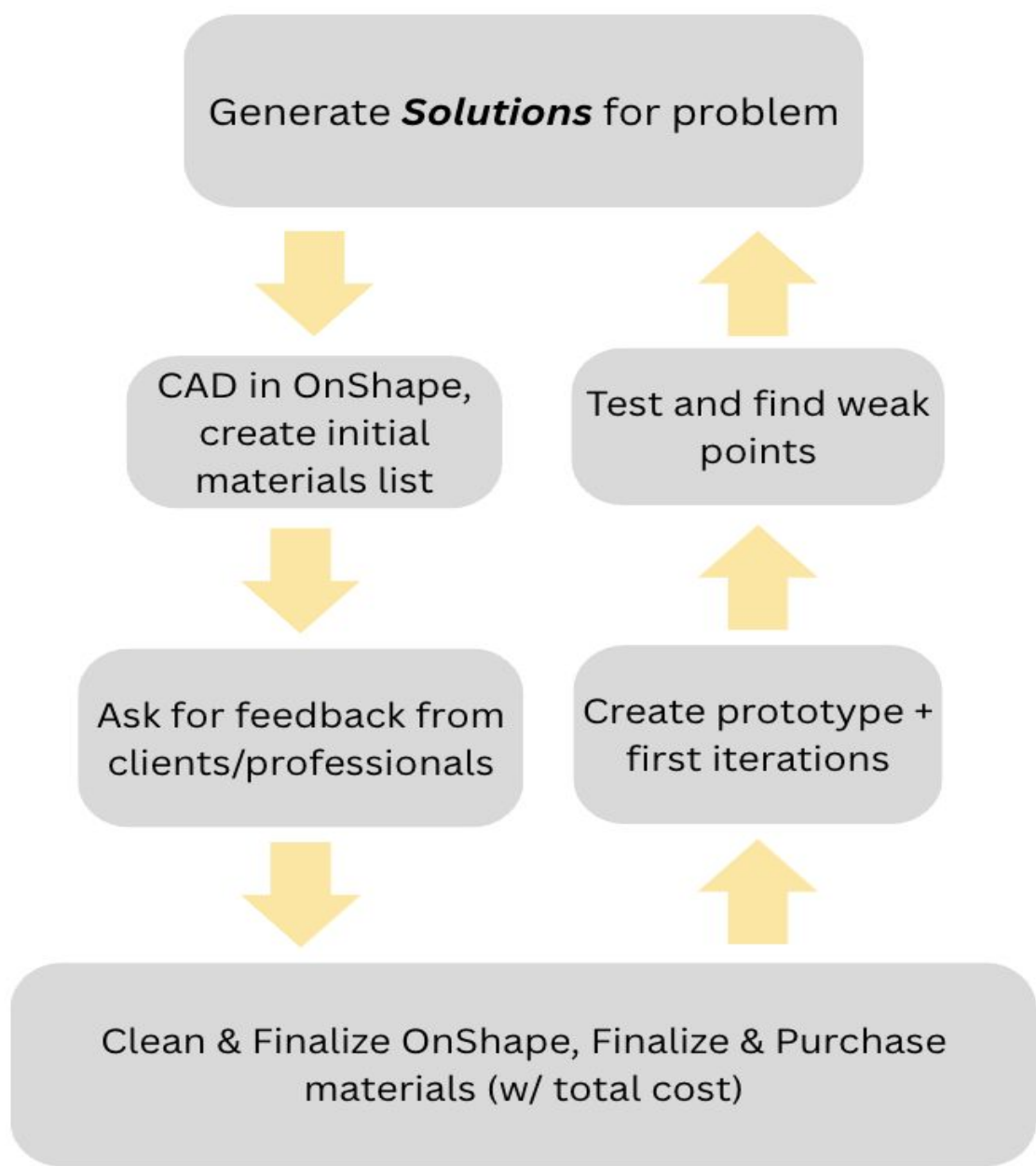
Problem Statement

People who commonly experience **syncope/limited mobility** often need to rely on others to **stabilize** them (Vasovagal Syncope). If they faint, they might fall and injure themselves. In open areas, they cannot sit on a bench or lean against a wall, so the risk of suddenly feeling faint/weak cannot be avoided.

Engineering Goal

Many **current designs** for personal seating/support, like a cane or chair, are **not easily portable**, leading to potential accidents due to their inaccessibility. The goal for this design is to create a **cane** that can contract to a **transportable size**, making it more accessible to bring around.

Methodology

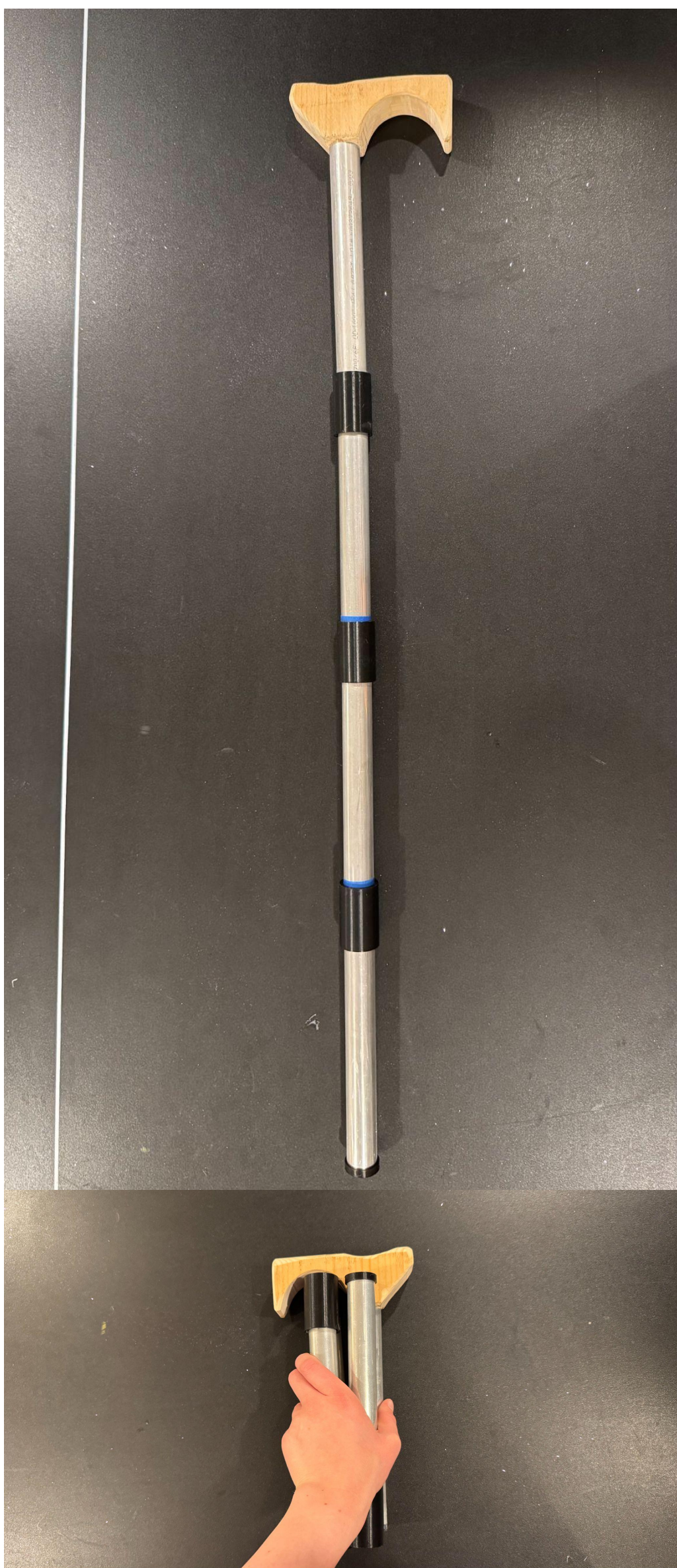


Our Current Design

B.U.N.J.E.E. V2

Why We **Chose** This Design:

- More stable than the telescoping cane (Design II)
- Easier to activate
- Simpler extended position locking
- Materials allowed for light weight without sacrificing height or stability



Design I

B.U.N.J.E.E. V1

Pros

- Simple construction
- Modular design
- Rapid deployment (7s for 3 segments)
- Cost-effective

Cons

- Outside connectors don't perfectly fit into string connectors
- Wider than preferred when condensed
- Inconsistency in activation



Design II

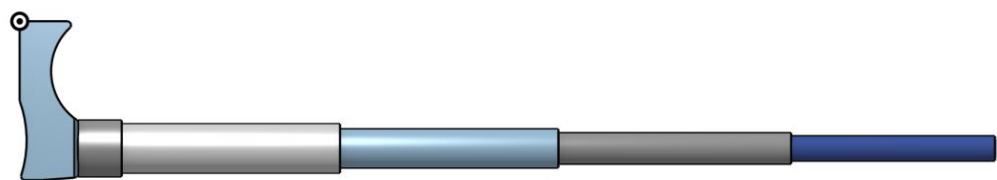
TELESCOPIC CANE

Pros

- Extremely small size what contracted
- Modular
- Customizable length while maintaining the form factor

Cons

- Release system has not yet been figured out
- Has more weak points and cannot support as much weight



Design Study I

Consolidation Efficiency

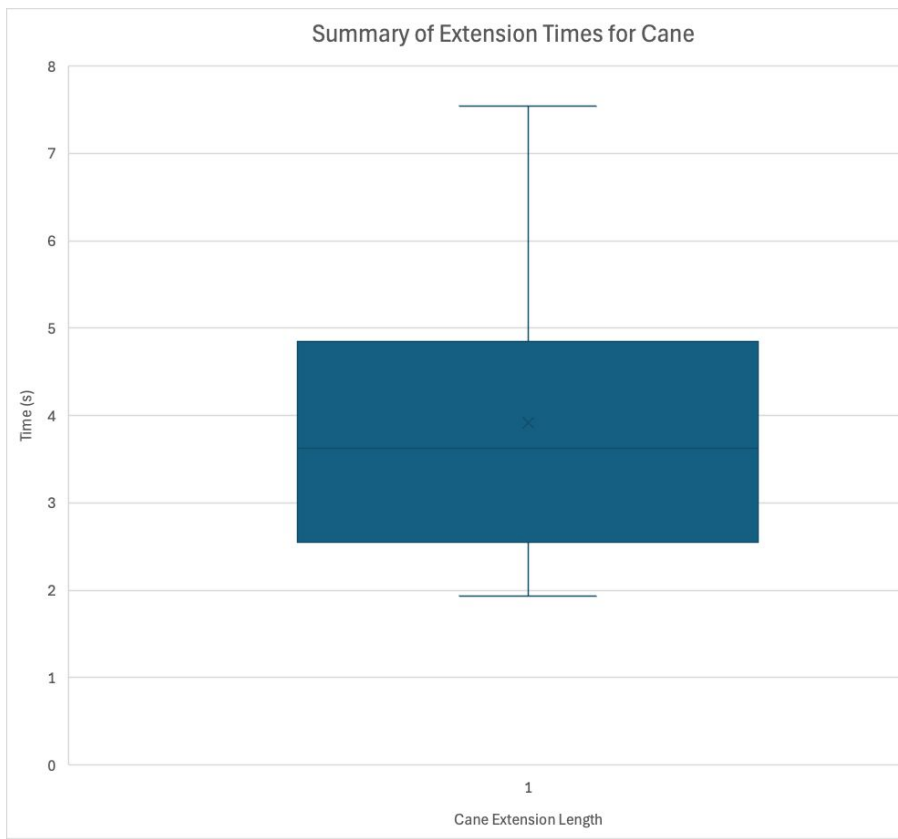
Purpose: To measure how **quickly the cane can extend**

IV: Starting config.

DV: Time to extend device

Findings:

$T_{avg} = 3.91s$



Design Study II

Durability

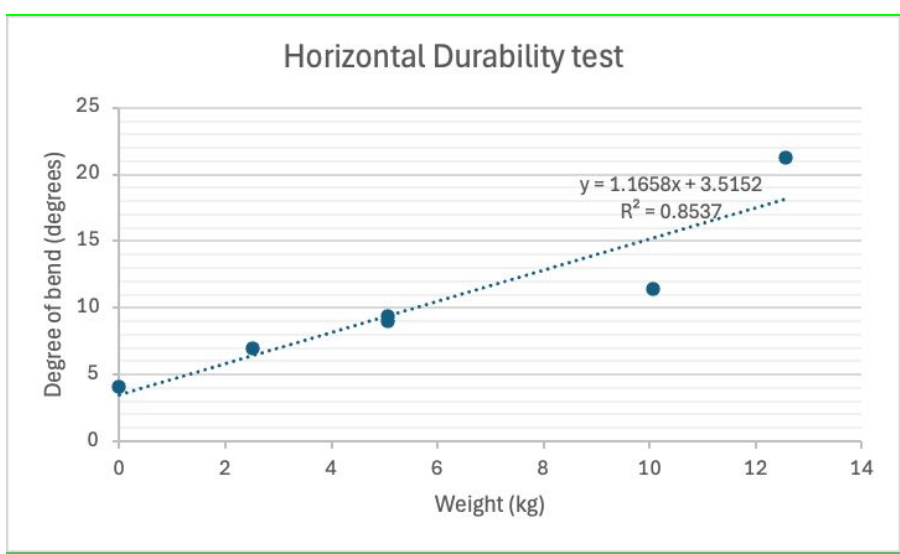
Purpose: To determine max **force** the device can withstand before deformation

IV: Applied force

DV: Deformation

Findings:

$F_{max} = 128.4N$



Design Study III

Streamline Comfort

Purpose: To determine if the handle streamlined for **comfort**

IV: Handle Design

DV: User response

Findings:

1 - 0%

2 - 3.33%

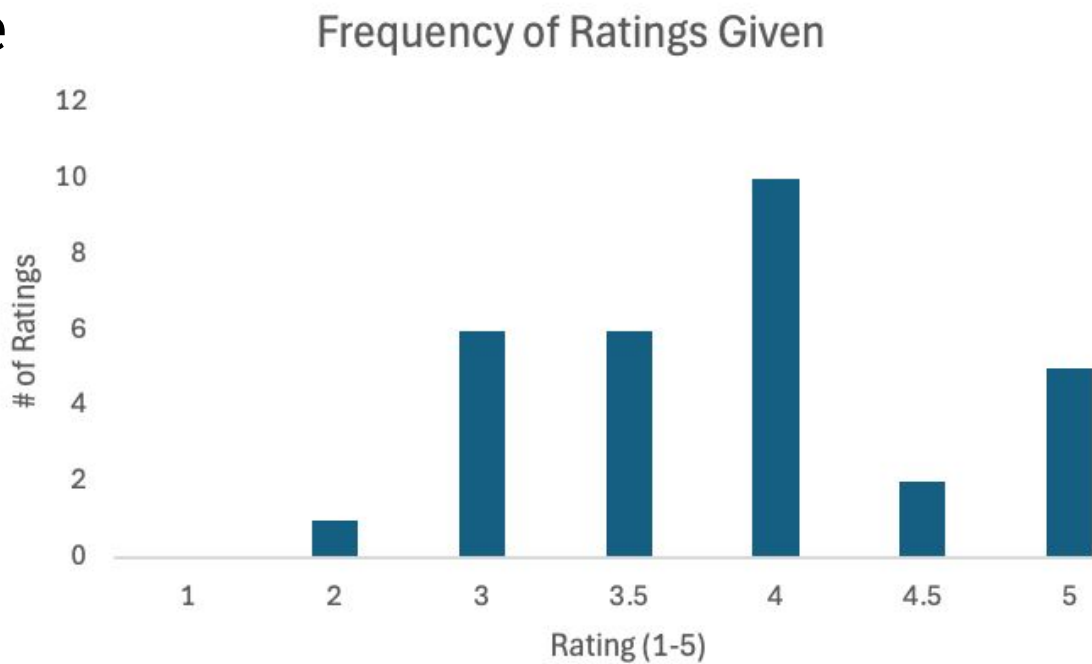
3 - 20%

3.5 - 20%

4 - 33.33%

4.5 - 6.67%

5 - 16.67%



Conclusions & Future Work

- The device satisfies most of our criteria, but future work can allow for better fulfillment of these requirements

- Incorporate a locking method to keep the extended cane from deploying
- Add chamfers to guide segments together during deployment, therefore reducing extension time