# DEPARTMENT OF MECHANICAL ENGINEERING

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### Motivation, Goal, Impact

### **Our Goal:**

 build a device that gives independence back to the elderly users who cannot climb stairs on their own

### The Impact:

- improve the lives of the elderly
- lessen concern from family and caregivers regarding independent activities

## Requirements

- mechanical
- affordable • portable
- lightweight

- versatile
- users
- intuitive

### **Design Calculations & Decisions**

- could not be a electrical design due to weight limits and over complication of device for the elderly
- decided against walkers and basic canes due to lack of stability
- the railing attachment covers all requirements without losing any key features
- based on a DSM, DFMEA, FEA, basic moment calculations, stress and shear calculations, bolt analysis, friction testing, safety testing, static testing, and an LCA, we decided on our final design

## F2 - Raising Canes **Elderly Stair Climbing Assistive Device**

 easy to use reliable and safe • low maintenance • comfortable for





Our tests proved adequate friction based resistance with the breaks, safety for all users, comfort, and a smooth rolling mechanism across all kinds of stair climbing



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#### **Prototype & Test Results**







