**Problem Landscape**

- About 33% of the world does not have access to sanitary toilet facilities, most in countries affected by landmines.
- In Uganda alone, there are over 2400 landmine survivors (the-monitor.org).
- Negative societal stigmas in third world countries make it difficult for individuals with disabilities to reintegrate into society.

**Goal**

- Help increase the mobility of landmine survivors and other individuals with disabilities, and help them to use pit latrines in a safe and sanitary manner.

**Customer Requirements**

**Physical:**
- Holds up to 250 lbs
- Wheels
- Brake system
- Insertable toilet seat
- Stable on uneven terrain

**Functional:**
- Local materials
- Local manufacturing processes
- Costs $5 or less
- Visually appealing
- User friendly design
- Decrease stigma of having a disability

**Current Design**

**Implementation Plan**

<table>
<thead>
<tr>
<th>Test</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use walker in Tecolote Canyon</td>
<td>Ensure stability on uneven terrain, similar to that in Uganda</td>
</tr>
<tr>
<td>Monitor heart rate during use</td>
<td>Make sure that use of the walker will not significantly increase energy expenditure</td>
</tr>
<tr>
<td>Standardize manufacturing processes</td>
<td>Confirm that process is easily repeatable and teachable</td>
</tr>
</tbody>
</table>

**Partnership with ULSA**

The M.O.V.E. team is planning on travelling to Uganda in June 2018. While there, they will work with carpentry students and the Uganda Landmine Survivors Association (ULSA) to conduct field tests and ensure the sustainability of the project.

**Project Roles**

- Kathryn Forsythe - Team Leader
- Melanie Kliegel - Chief Editor
- Davis Giles - Wheel Attachment subsystem Designer
- Taylor Bongiovanni - Frame subsystem Designer

**Design Analysis**

- Wooden Seat Stress Analysis

**Key Factors of Safety**

<table>
<thead>
<tr>
<th>Subsystem</th>
<th>Factor of Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wooden Seat</td>
<td>5</td>
</tr>
<tr>
<td>Column Buckling (1 ¼”)</td>
<td>4.9</td>
</tr>
<tr>
<td>Column Buckling (1”)</td>
<td>2</td>
</tr>
</tbody>
</table>

**Acknowledgements**

- Thank you to Dr. Mikaya Lumori for sharing advice and encouragement.
- Margaret Orech and the Uganda Landmine Survivors Association for information regarding materials, manufacturing processes, and a platform for distribution of devices in Uganda.
- USD Associated Students for financial assistance.
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Sources: