Unmet Need

Drop Foot
- Nerve damage that affects tibialis anterior
- Tibialis anterior needed to squat
- Unstable user falls forward

No Current Solutions

Solution

Goal: translate device to local materials found in low income countries

Adjustable Hinge
Leg Straps
Shell
Bamboo Peg
Rubber Foot

Approach & Requirements

\[ \theta = 47 \pm 5^\circ \]
\[ M_A = 8.53 \text{ Nm} \]
\[ F_{\text{COG}} \]
\[ F_{\text{GRF}} \]
\[ M_A \]
\[ \text{EMG (mV)} \]
\[ \text{Time (s)} \]

<7.6 Adjustments per minute

Stable Squat

Advantages
- Return to daily activities
- Inclusion/Independence
  - ↓ Cultural Stigma

Disadvantage
Theft

75% of the World Population Utilizes Flat Foot Squats

User is stable in squat

\[ R1: \quad \theta = 49 \pm 2^\circ \]
\[ R2: \quad F_{\text{peg}} < F_{\text{critical}} \]
\[ 36 \text{ N} < 3600 \text{ N} \]
\[ R3: \quad 1.2 \text{ adjustments per minute} \]

Acknowledgements:
F. Allen, PhD\(^1\), S. Balasubramanian, PhD\(^1\), A. Shieh, PhD\(^1\), W. Shih, PhD\(^1\), S. Marquez, PhD\(^2\), Idris Robinson, MPH\(^2\)