

Voting with Joy

A Smart Voting Joystick For Accessible Voting

Yangyi Chen, Tyler Dennis, Graham Pence, Behdad Rashidian, Joy Yang, Stephen R. Blosser, Graham L. Pierce, Sarah J. Swierenga

Design Challenge

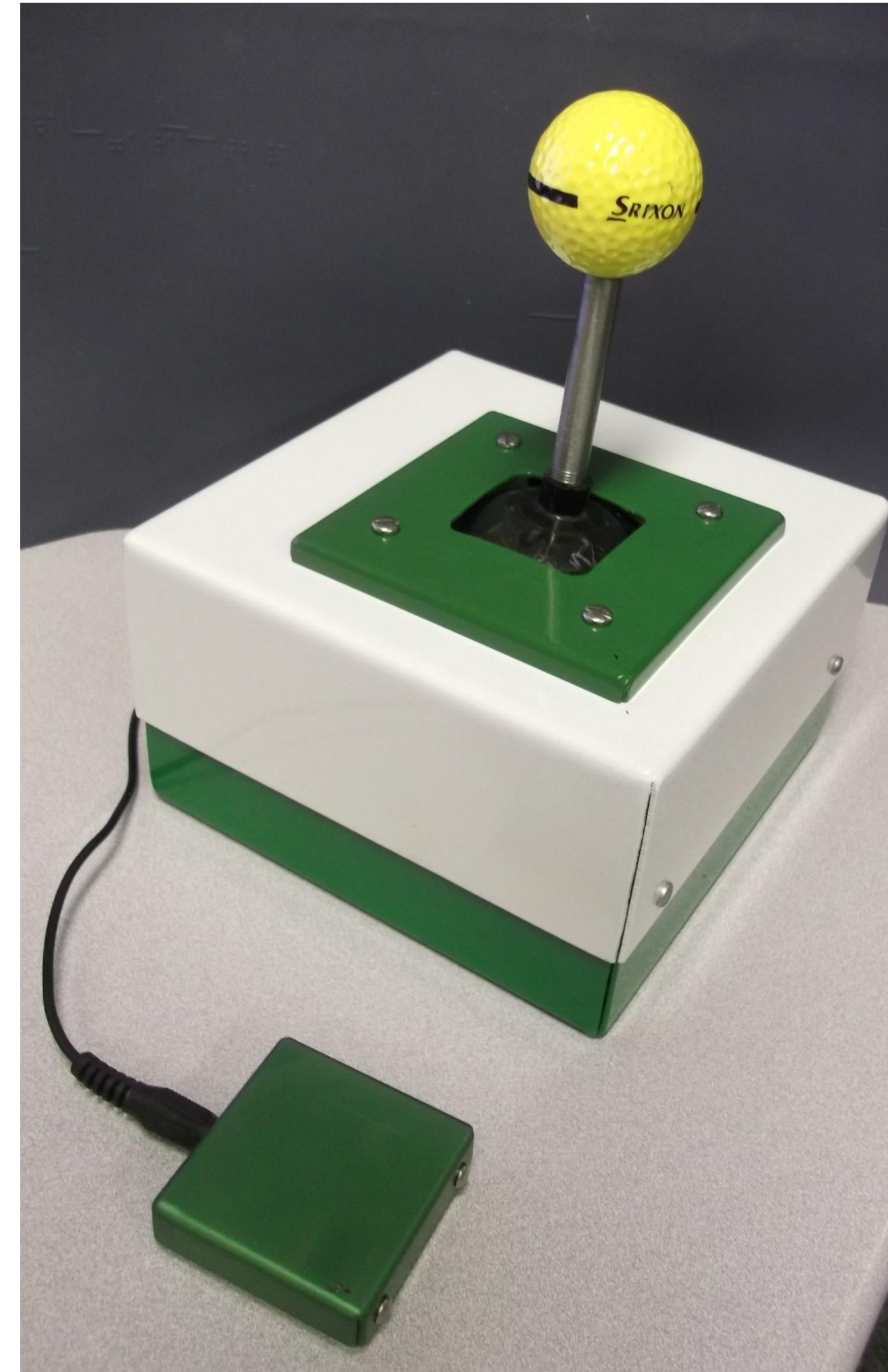
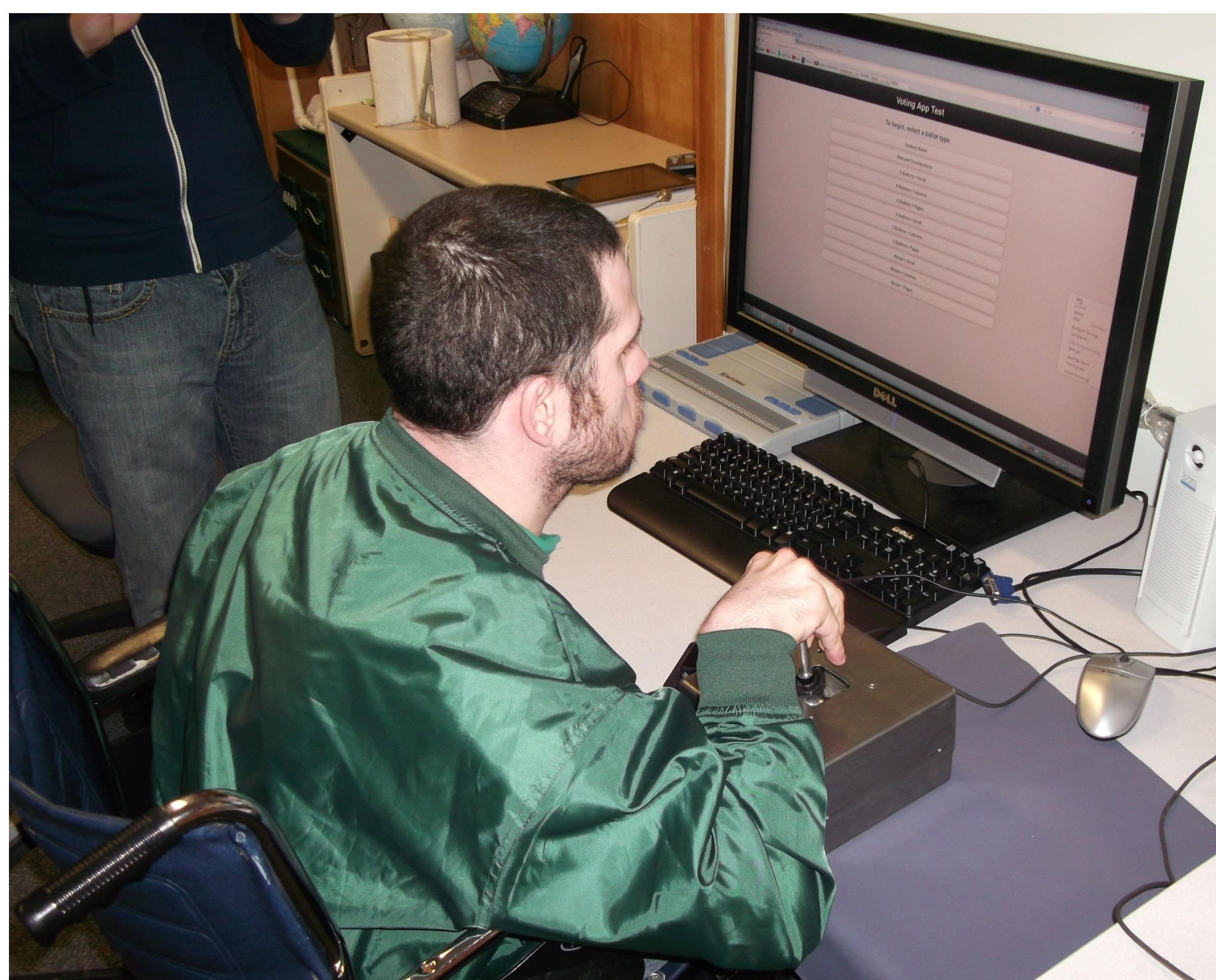
- Individuals with limited usage of their hands have difficulties using current input devices on voting systems
- 6.7 million United States citizens have difficulty grasping objects (United States Census)
- Design a joystick to enable independent and private voting
- Vote a shortened NIST Test Ballot on a computer

Smart Voting Joystick Design Goals

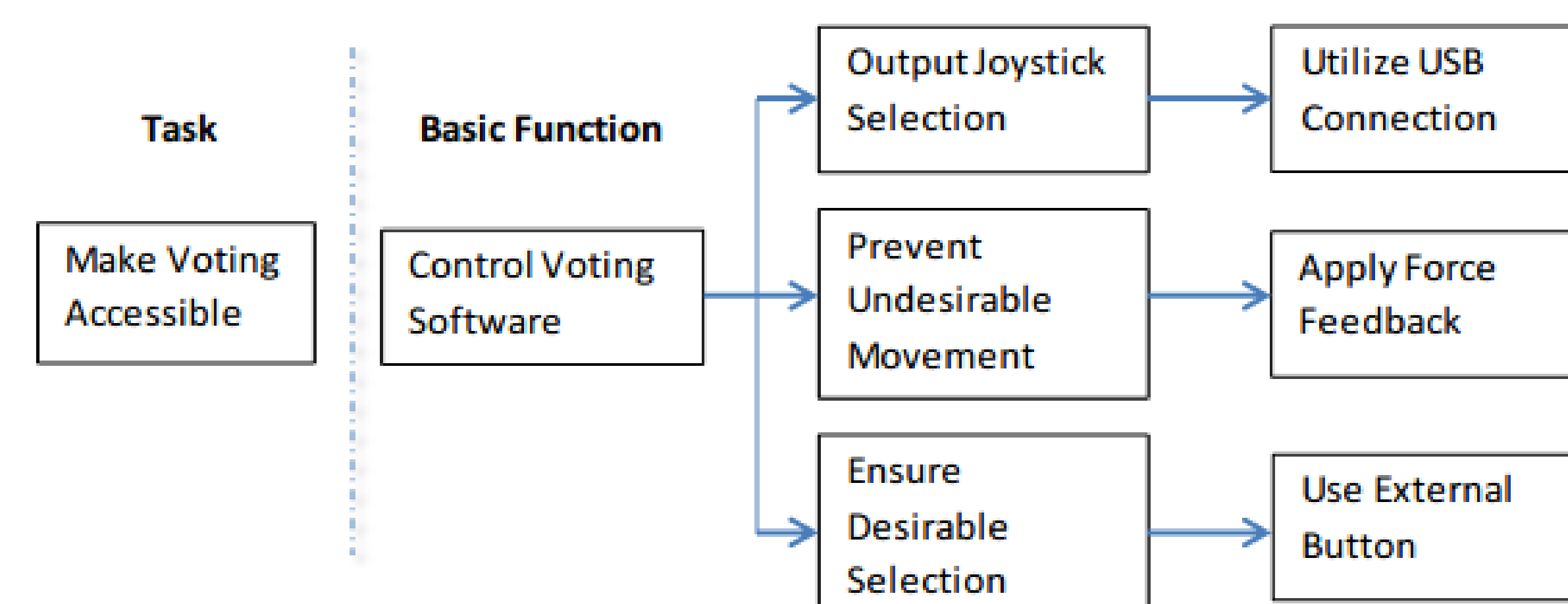
- Accommodate a wide variety of different motor needs.
- Intuitive, universally-designed functionality
- Haptic force feedback enabling users to 'feel' ballot
- Local stability to prevent accidental movement
- Convenient to use

User Feedback

Branden, a student with disabilities, tests the joystick and provides valuable guidance to the team



Design Concept



Technical Design Details

- Smart dual axis joystick with force feedback control
- Programmable feedback schemes
 - auditory, haptic, visual, adjustable tension
- Sturdy mechanical housing
- Easy to change ball handle
- External select button
- Universal mounting device

The Motivation

- Jim is an Intramural Sports Coordinator at Michigan State University who experiences cerebral palsy.
- Jim uses joysticks to navigate in his wheelchair as well as his computer.
- Jim pioneered many innovative joystick functions that he is delighted to share with the world to make voting a pleasure for others like him.



More Information

For more information about this project, please visit the grant website:

<http://elections.itif.org/projects/grants/round-2-funded-projects/michigan-state-university/>

This research was funded through a grant from the Information Technology & Innovation Foundation (ITIF), Accessible Voting Technology Initiative (AVTI) to Michigan State University (ITIF Subgrant No. 2013004; Prime Grant No. EAC110149B – U.S. Election Assistance Commission).
Principal Investigator: Dr. Sarah J. Swierenga, MSU, Usability /Accessibility Research and Consulting