



# RAAW

Research Alliance for Accessible Voting

Juan E. Gilbert, Ph.D.

Presidential Endowed Professor & Chair  
Human-Centered Computing Division  
School of Computing

Professor Automotive Engineering  
Clemson University  
juan@clemson.edu

Twitter: @DrJuanGilbert

<http://www.JuanGilbert.com/>

<http://www.HumanCenteredComputing.org/>



# UNITED STATES ELECTION ASSISTANCE COMMISSION

- Accessible Voting Technology Grant
- \$4.5 million over 3 years
- Demonstration projects/elections
- Innovations in voting technologies with our partners ...



# UNITED STATES ELECTION ASSISTANCE COMMISSION

*Center for  
Accessible  
Information*



TENNESSEE  
DISABILITY  
COALITION



**NIST**  
National Institute of  
Standards and Technology  
U.S. Department of Commerce



Association of  
Assistive Technology Act Programs





UNITED STATES  
ELECTION ASSISTANCE COMMISSION

Carnegie Mellon University  
Silicon Valley



CLEMSON<sup>®</sup>  
U N I V E R S I T Y

clemson  hcc



clemson  hcc



Accessible Voting Technologies

# Voter - Multimodal

- Multimodal Interactions
  - Voters can speak and touch interchangeably





# Voter - Visual

- Touch screen tablets
  - Large fonts
  - Images or No Images
  - Touchable Names
- Voter touches the screen to make selection
  - Confirmation is visual
- Ballot layout
  - One race per screen
  - Voter confirms ballot twice before it is recorded



# Voter - Haptic

- Rocker Switch
  - Large texture on buttons
  - Select and Next
- Voter presses the button to make a selection
  - Confirmation is verbal and visual





# Voter - Verbal



- Headset
  - The system speaks to the voter through the headset
  - Conversation is confidential – no one can hear the machine’s speech, but the voter
  - System’s speech can be pre-recorded or computer generated or both.
- Embedded microphone in the headset
  - Voter speaks words like “vote”, “continue”, etc. or blows into the microphone
  - Confirmation is verbal

# The World's Most Accessible Voting Technology

- Sighted
- Blind
- Deaf
- Illiteracy
  - Sighted and Blind
- Physical Disabilities
  - Limited or no use of hands
  - For example, military wounded in Iraq, elderly, etc.
- All of these voters can privately and independently vote!



# Prime III

Security



# Security - VVGB



- Voter-Verified Ballot (VVB)
  - Printed ballots will contain only the selections for each race
  - May be printed on paper with a watermark
  - **Green** approach to voting
    - All paper is used and recycled

## NIST Standard Ballot



1. President and Vice-President ==> Joseph Barchi and Joseph Hallaren (B)
2. US Senate ==> Dennis Weiford (B)
3. US Representative ==> Brad Plunkard (B)
4. Governor ==> Charlene Franz (B)
5. Lieutenant-Governor ==> Chris Norberg (B)
6. County Commissioners ==> Clayton Bainbridge (B)
6. County Commissioners (write-in) ==> Julian R. Gilbert ; Jackson R. Gilbert
7. Proposition #1 ==> Yes
8. Amendment #1 ==> Accept

1889

# Pilots

- NSBE Election (2008 - 2014)
- National Council on Independent Living (NCIL)
- Presidential Mock Election at Auburn University
- State of Oregon (May 2012)





# Pilots

- Self Advocates Becoming Empowered (SABE 2012)
  - Ballot contained photos of the candidates
- Clemson Elementary School (2012)



# Pilot Election

- Wisconsin
  - April 1, 2014



# Pilot Challenges

- Election Officials
  - In many cases, unwilling to participate
  - It takes a lot of work to convince some of them
- Vendors
  - It took a lot of time to communicate that we are not vendors
- Participants
  - Getting a diverse group to participate



# Questions???

<http://www.AccessibleVoting.org>

Juan E. Gilbert, Ph.D.

Presidential Endowed Professor & Chair Human-Centered Computing Division

School of Computing

Professor Automotive Engineering

Clemson University

[juan@clemson.edu](mailto:juan@clemson.edu)

Twitter: @DrJuanGilbert

<http://www.JuanGilbert.com/>

<http://www.HumanCenteredComputing.org/>

<http://www.clemson.edu/computing>

