LiveWell RERC: Information and Communication Technology to Promote Safety and Independence
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Mission and Purpose
• To promote information and communication technology (ICT) access for all people regardless of ability
• To develop / validate ICT applications to improve the capacity for independent living and community participation
• Smart Home Stress Assist, Speak Up: An SPL Meter, and the Gaitbox to be presented
• Talk to the authors about collaborations

Smart Home Stress Assist
Background
• Military service members with traumatic brain injury (TBI) and post-traumatic stress disorder (PTSD) use evidence-based grounding strategies as an intervention to post-traumatic stress (PTS)
• Grounding: strategies designed to immediately connect a person with the present moment to avoid re-experiencing past trauma and pain. Often designed to redirect focus to environmental features, i.e. sound, lighting, smells, temp
• Individuals have trouble initiating strategies and setting up complex grounding interventions at time of stress

Solution
• Developed tool to facilitate grounding using Amazon Echo and smart home devices that:
  • Changes physical environment (lights, music, sounds, temperature)
  • Plays personalized recordings (e.g. favorite song or soothing family member)
  • Prompts deep breathing exercises
  • Contacts family/provider by text
  • Future: Log data for future analysis and symptom management

Speak Up: An SPL Meter
Background
• Some children and adults with cognitive or sensory impairment have a hard time monitoring and moderating their speaking volume
• Speech pathologists use sound pressure level (SPL) meters as a tool to facilitate therapy
• Many children are uninterested in standard SPL meters and other apps are not designed for therapy and offer no ‘kid-friendly’ features

Solution
• Developed an Android app that monitors sound with device’s built-in microphone & converts sounds into decibels to control an interactive image
• Speaking louder moves image upwards and speaking lower moves image down
Goal: to keep the image within the green color zone
• Zones set from configuration screen and are customizable
• App has bouncing ball image to make applicable to both children and adults

Walking Speed Monitor: the Gaitbox
Background
• Gait or walking speed is a strong predictor of functional status and survival amongst older adults
• Current measurement methods require either expensive equipment or a trained technician with a measuring tape
• Manual measurement techniques are prone to error between timers and trials

Solution
• Low cost device that uses LIDAR sensor and a microcontroller to measure and display walking speed
• Speed is automatically displayed on an LCD screen and measuring distances are adjustable

Validation Testing
• 2 prospective validation studies comparing Gaitbox, stopwatch with human timer, and Sprint System (IR break beam) used simultaneously to measure gait speed – subjects completed 4 timed trials and were instructed to walk at a comfortable pace
  1) 30 healthy older adults completing 4 m walk test
  2) 44 SCI, MS, and otherwise healthy population completing 10 m walk test

Results
1) 0.980 & 2) 0.988 correlation between Gaitbox and Sprint system

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