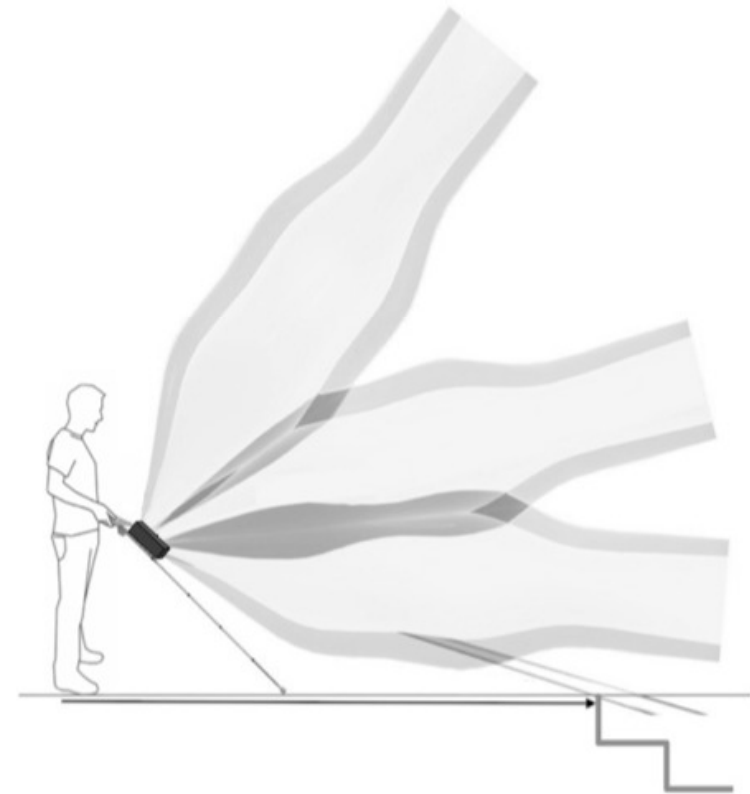


Advanced Augmented White Cane with Obstacle Height and Distance Feedback

R Pyun, Y Kim, P Wespe, R Gassert: ETH Zurich
S Schneller: Zurich University of the Arts

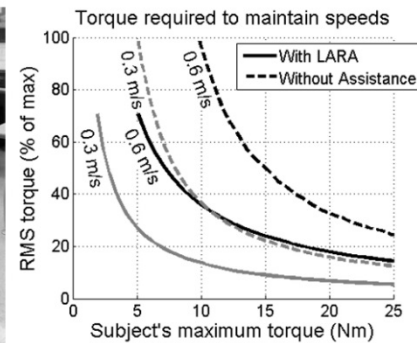
- A novel electronic travel aid, the Advanced Augmented White Cane, has been developed to help visually impaired people navigate the surroundings
- The device detects obstacles at four vertical levels and provides multi-modal feedback
- The device was evaluated through reaction time and drop-off detection reliability measurements



**Lever-actuated resonance assistance (LARA):
A wheelchair-based method for upper extremity therapy and overground
ambulation for people with severe arm impairment**

Daniel K. Zondervan, Brendan Smith, David J. Reinkensmeyer
The University of California, Irvine, USA

- We are using LARA to provide a means for severely impaired people to exercise their arms and perform self-powered overground ambulation in a wheelchair.
- We have observed promising clinical results with LARA for stationary exercise, and present a unique user interface that allows individuals to play computer games while performing these exercises.
- Through simulation, we have also demonstrated that LARA theoretically allows people with severe arm weakness to propel themselves with reduced effort and obtain speeds previously unattainable in a manual wheelchair.



Designing Speech-Based Interfaces for Telepresence Robots for People with Disabilities

Katherine Tsui, Kelsey Flynn, Amelia McHugh, and Holly Yanco
(University of Massachusetts Lowell)

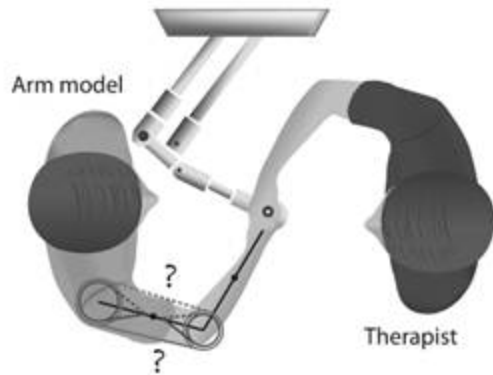
David Kontak (Crotched Mountain Rehabilitation Center)

- Telepresence robots may allow people with cognitive and/or motor disabilities to engage in social activities in remote places (e.g., museum, concert).
- We conducted a formative assessment of user expectation in which 12 participants from our target population gave verbal spatial commands to a person or “Wizard of Oz” controlled robot.
- We present guidelines for speech-based interfaces for telepresence robots.



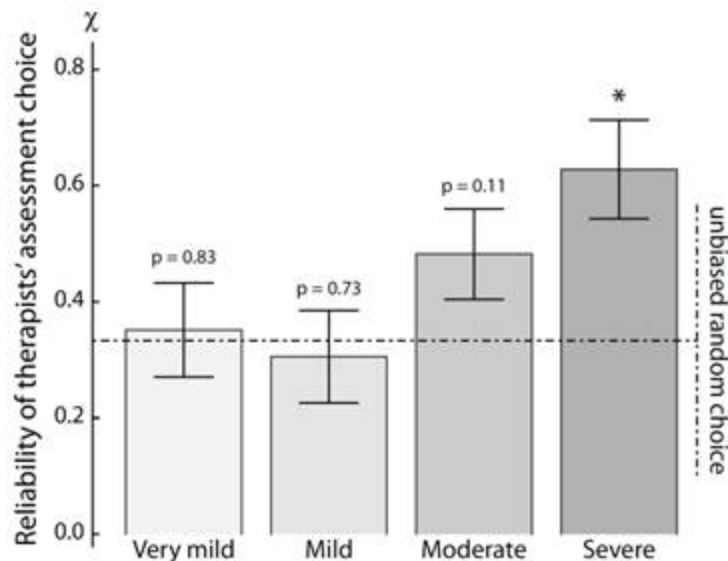
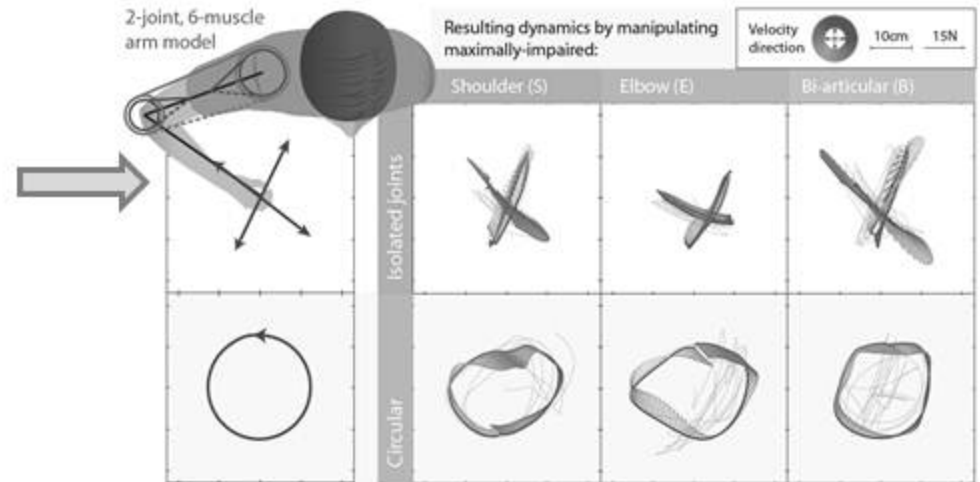
Therapist recognition of impaired muscle groups in simulated multi-joint hypertonia

A. Melendez-Calderon*, D. Piovesan*, F.A. Mussa-Ivaldi * equal contribution



We developed a physical simulator to test the capability of therapists to assess which specific group of muscle is impaired.

The preferred probing motions isolated individual joints or resembled circular movements



These motions are not a successful strategy for discriminating the location of impairments.

Integrated Vision-based Robotic Arm Interface for Operators with Upper Limb Mobility Impairments

H. Jiang, J.P. Wachs, B.S. Duerstock: Purdue University

- A gesture recognition-based interface integrated with object and face detection modules has been developed to allow quadriplegics using customized upper extremity gestures to control a commercial wheelchair-mounted robotic manipulator (WMRM).
- Manually (gestures) and semi-manual (gestures, automatic face and object detection) control modes were compared.
- Experimental results validate the feasibility of the system and the efficiency of semi-manual control mode

