Focusing on the Interface of Mechatronic Devices in Rehabilitation Applications

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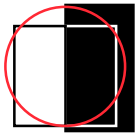

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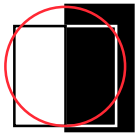
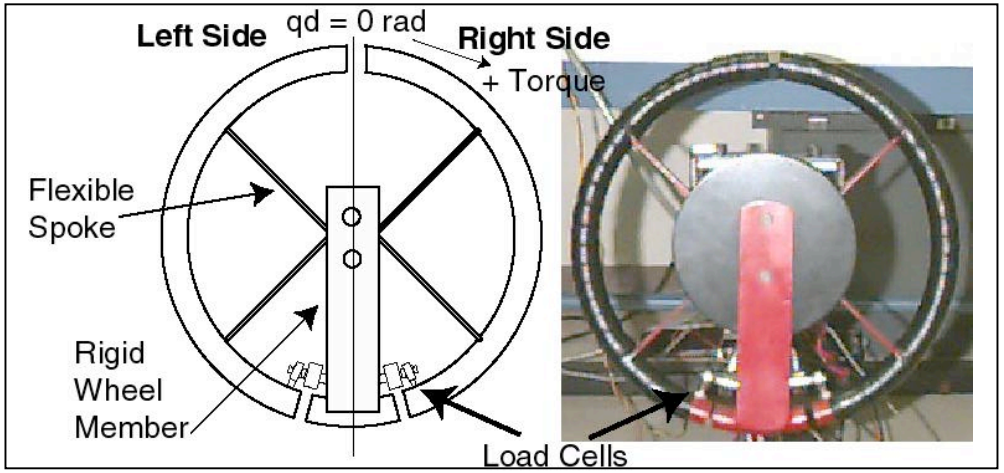


Recent Research Projects

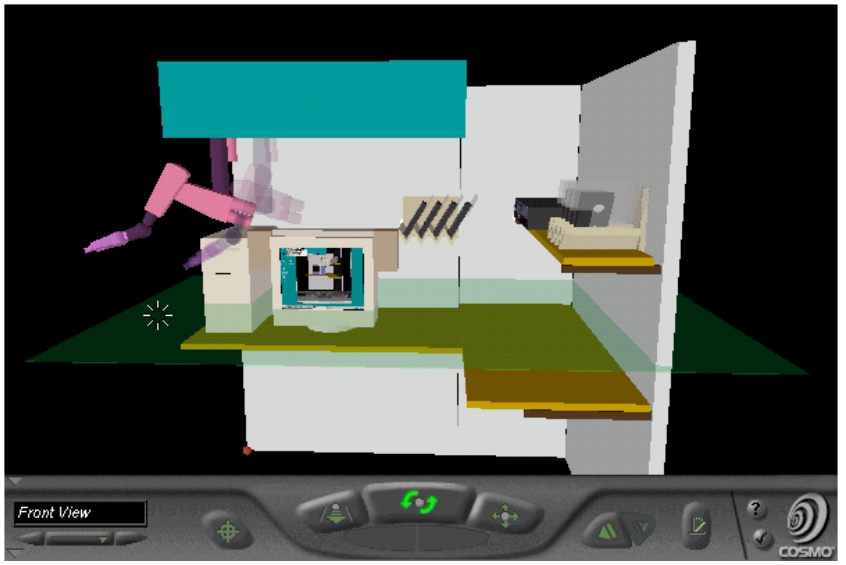
- **MIME**: therapy robotics: post-stroke, bimanual upper-limb exercise

- **Driver's SEAT**: VR-based physical therapy for improved motivation and compliance

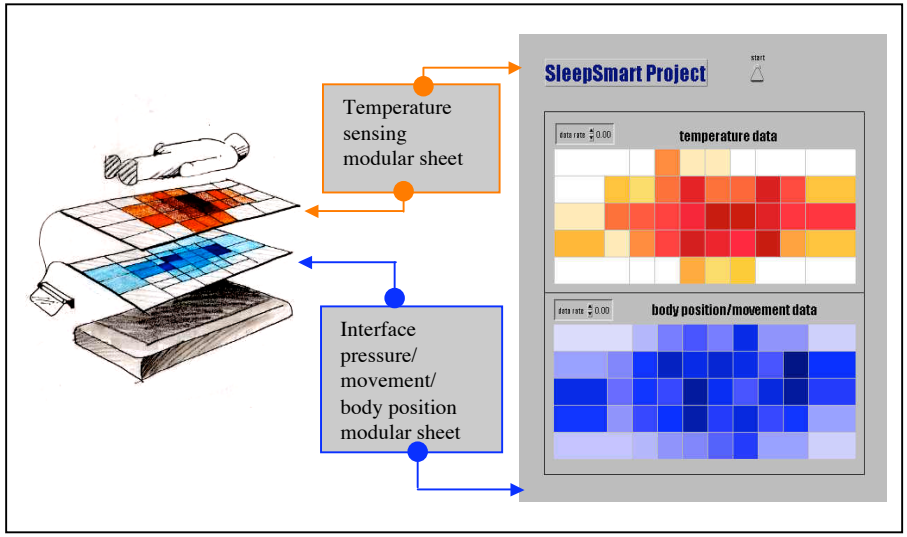


Recent Research Projects

- **ProVAR**: interface design for an assistive robot to improve the quality of life and independence for people with physical disabilities

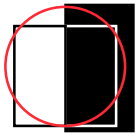


- **SleepSmart**: sleep quality improvement through unobtrusive vital signs monitoring and correlation with lifestyle variables



Ongoing Research Projects

- **Stanford Personal Robotics Program**: create the first integrated hardware and open-source software development platform for Personal Robotics
- **Rehabilitation Haptics**: develop a home-based, bimanual grasp and wrist function device for post-stroke exercise
- **LifeStory**: Developing use scenarios, technologies and applications for ubiquitous personal video



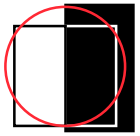
Challenges for Assistive Technology Development

University Opportunities for Learning

- Engineering and design methods
- ME Dept. Biomechanics Division
- Bioengineering Department (biodesign, biorobotics)

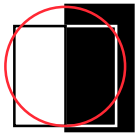
Interdisciplinary Research

- physicians
- engineers
- therapists
- human factors experts
- computer scientists
- …



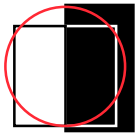
Challenges and Outlooks

- Rehabilitation and enhancement technologies of the future
  - direct brain interfaces
  - micro/nano-technologies
  - ubiquitous computing/robotics/networking
- Mainstreaming disability
  - Perspective of well-being in the context of each person's life situation



Future Avenues

- Bioethics of robotic and NBIC-convergence technologies
- Focus on the education of designers
  - team-based and project-based learning
  - world-aware, distributed design-development teams
  - cross-cultural design of mechatronics devices with user interfaces



Acknowledgments

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Stanford Center for Biomedical Ethics: http://scbe.stanford.edu
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