

# *User Interfaces for Mobile and Wearable Computing*

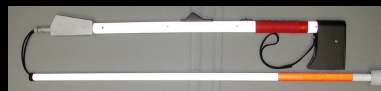
## *Assistive User Interfaces*

COMS E6176  
Prof. Feiner  
Columbia University  
April 13, 2004

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## *Laser Cane*

- Laser Cane
  - Warns of obstacles through audio/tactile feedback
  - Laser beams aimed above and ahead, reflected back and sensed if obstacle found



Nurion-Raycal

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# Guide Cane

- Guide Cane
  - User sets direction using joystick on handle
  - Compass and odometers determine path
  - Ultrasonic sensors detect obstacles
  - Servo motors steer user around obstacle and back on path



J. Borenstein and I. Ulrich

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# Navigation System for the Blind

- User wears
  - backpack with computer and GPS
  - earphones with compass
- Spatialized sound speaks names of landmarks

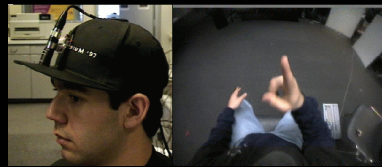


J. Loomis, R. Golledge, R. Klatzky, J. Speigle, and J. Tietz, *Proc. ASSETS '94*

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# *Wearable American Sign Language Recognition*

- User wears
  - cap with downward looking camera
- HMM-based recognition system



T. Starner, J. Weaver, and A. Pentland, *Proc. ISWC '97*

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# *Sign Language Generation*

- TESSA: TExt and Sign Support Assistant
  - Speech-to-text system transcribes speech of post office clerk
  - Avatar produces sign language for deaf customer
  - Tested in UK post offices



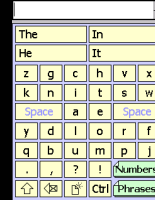
Movie

S. Cox, M. Lincoln, J. Tryggvason, M. Nakisa, M. Wells, M. Tutt, and S. Abbott, *Proc. ASSETS 2002*

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## Hand-Held Devices

- Pocket PC with speech synthesizer
- Different programs for different kinds of disabilities



<http://www.enkidu.net/>

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## HaWCoS: Hands-free Wheelchair Control System

- Electric wheelchair controlled by EMG signals from selected muscle group



T. Felzer and B. Freisleben,  
*Proc. ASSETS 2002*

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