Computer Access Options for Individuals with ALS

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Assistive Technology Practitioner

Objectives

- Identify common difficulties with computer access encountered by individuals with ALS.

- Become acquainted with computer access options.

- Locate the accessibility options available in a familiar computer's operating system.
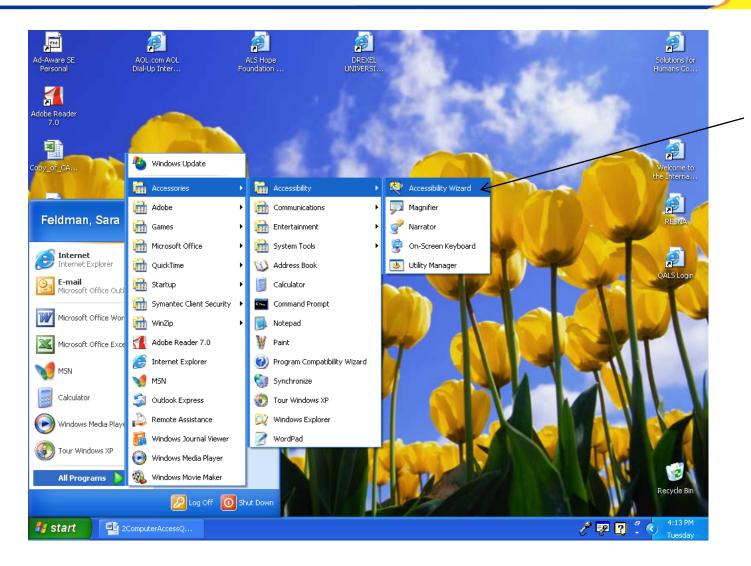
Accessibility Issues

- Difficulty using the standard keyboard

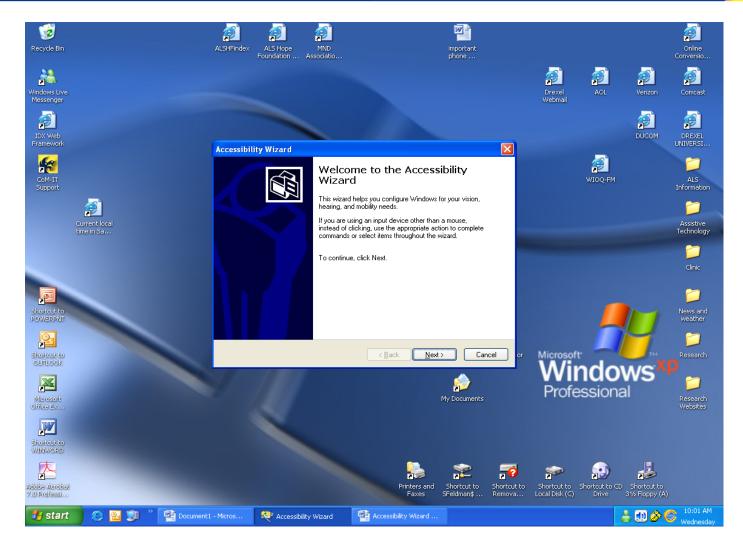- Difficulty using the standard mouse
  - Cursor
  - Click

- Difficulty with both

Accessibility in Windows XP
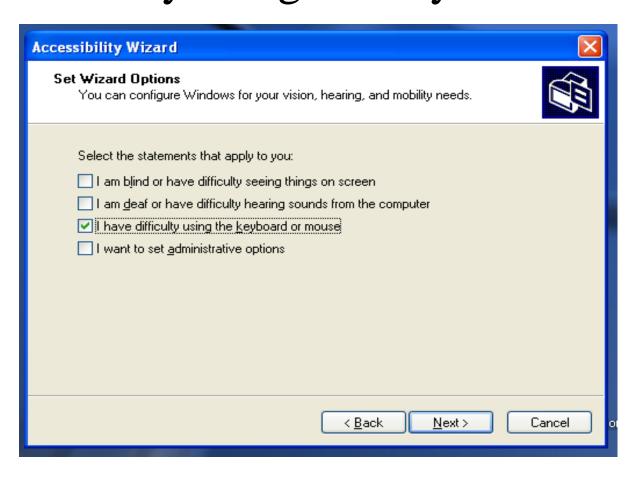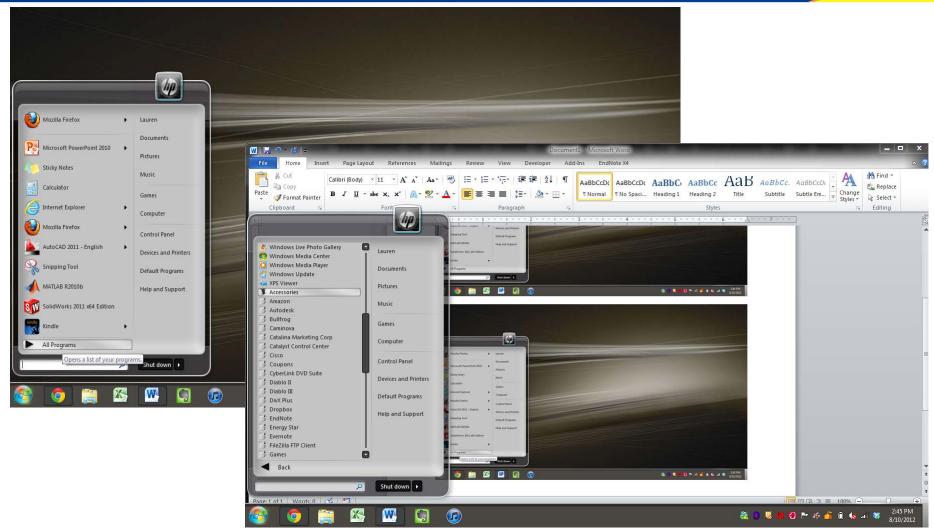
Accessibility Wizard

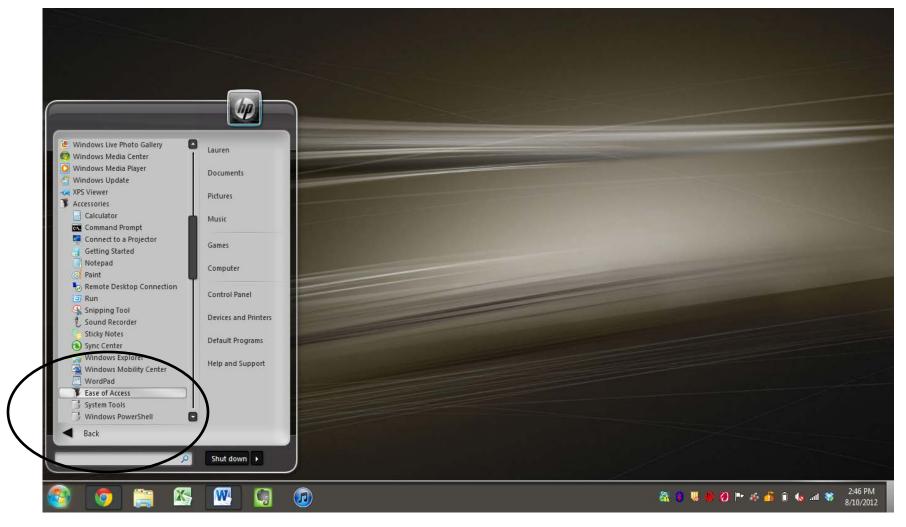# For the keyboard or mouse, choose "I have difficulty using the keyboard or mouse"
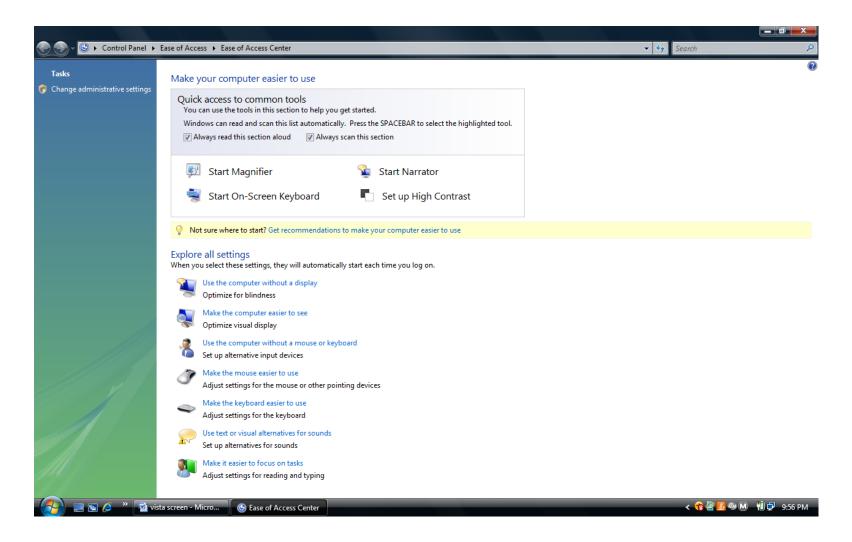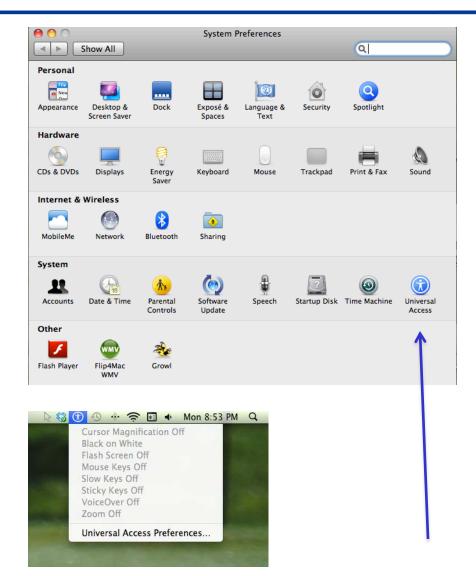
Accessibility in Windows

Ease of Access

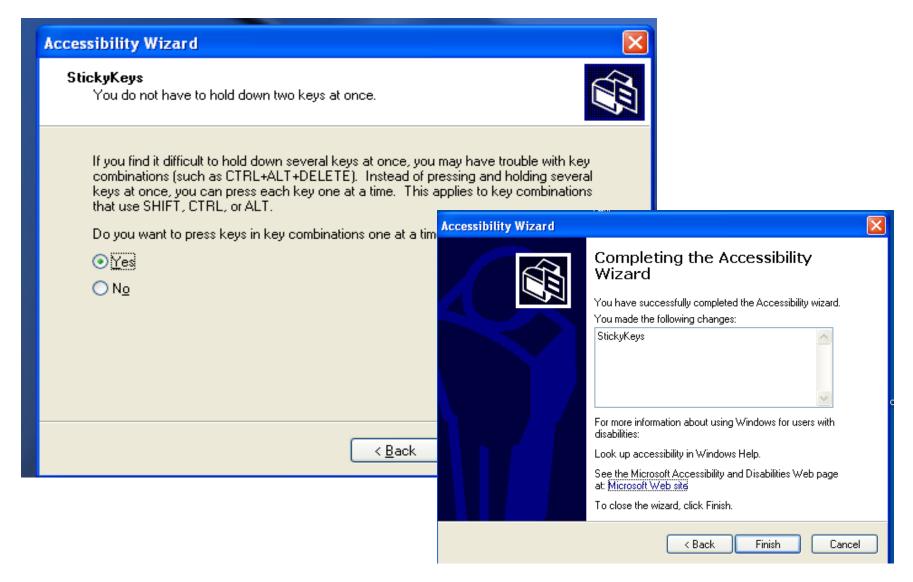# Ease of Access Center

Universal Access on Mac

Difficulty with standard keyboard

- System options
  - StickyKeys
- External supports
  - Arm supports
  - Orthotics
- Alternate keyboards

StickyKeys

Keyboard help in Windows

Arm Supports

- Access to the keyboard can be assisted by supporting the forearm

www.backdesigns.com/ErgoRest-Mobile-Arm-Support ($90.00)

Upper Extremity Orthotics

- Access to the keyboard can be assisted by supporting the wrist and hand

Dorsal wrist support

($33.00 -$45.00)

Universal cuff

($12.00)

North Coast Medical
www.ncmedical.com

Alternate Virtual Keyboards

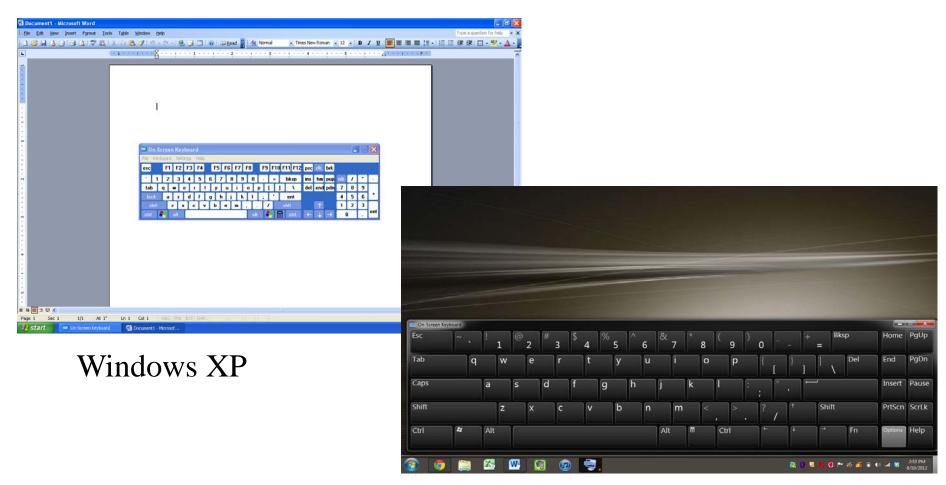- On-Screen as part of Windows
- Keyboard Viewer on Mac
- Down-loads
  - Click N Type
  - Free Virtual Keyboard
- Dasher

On-Screen Keyboard Microsoft

Windows XP

Windows 7

On-screen Keyboard
Mac

Input Sources → Keyboard viewer
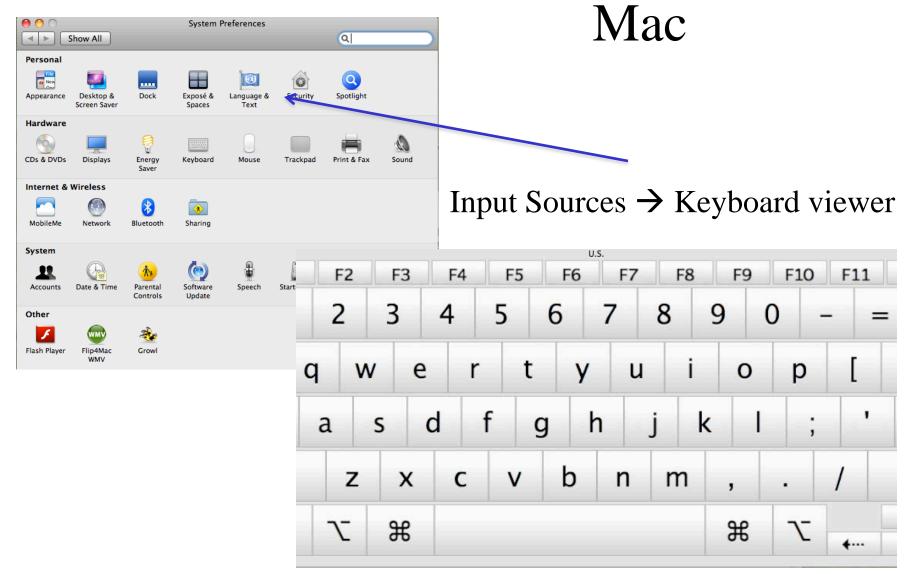
On-screen Keyboards Downloads
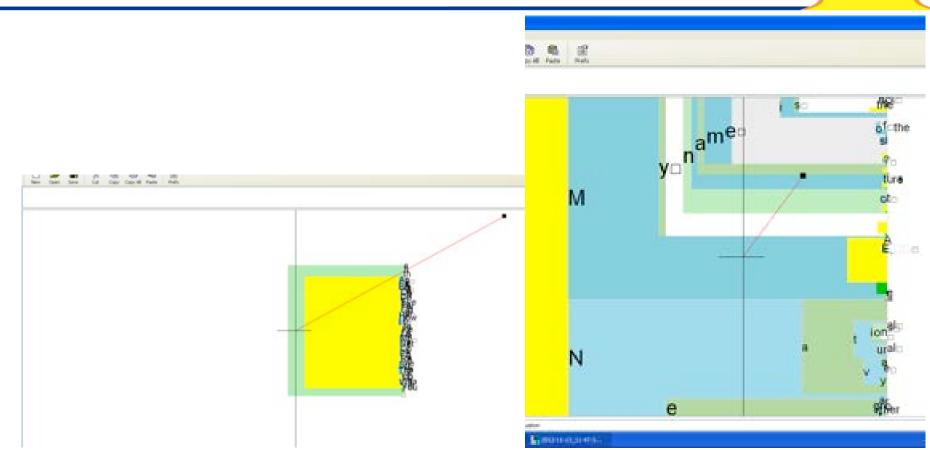
Click-N-Type
cnt.lakefolks.com

Free Virtual Keyboard
Freevirtualkeyboard.com

Dasher

www.inference.phy.cam.ac.uk/dasher/

Difficulty with the mouse cursor

- System changes
  - Change cursor settings
- External options
  - Alternate mouse
    - Remote
    - Track ball
    - Joystick
    - Touch pad
  - Head mouse
  - Mouse through wheelchair joystick
- Virtual

Mouse cursor options

Windows

Alternate mouse options

Remote or wireless
($25.00-$50.00)

Joystick

($50.00-$70.00)

Trackball ($20.00-$50.00)
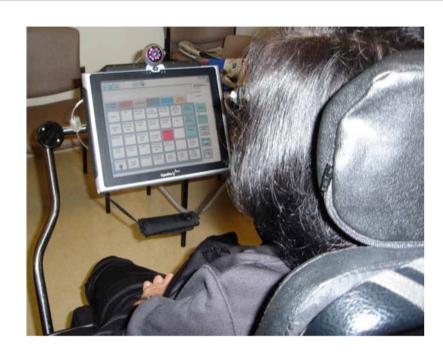
www.logitech.com

Touch pad ($80.00)

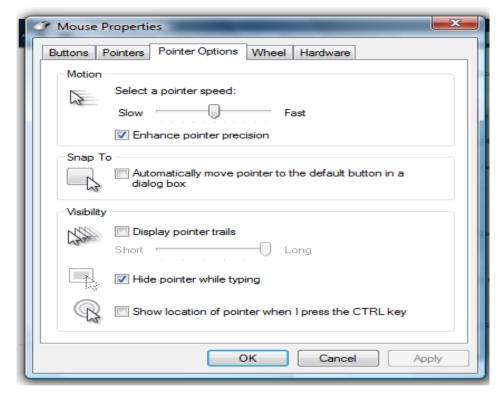# Head Mouse (Commercial)

- The cursor is moved through head movement.
- A reflective dot is placed on the forehead, which is detected by the sensor

Tracker Pro Madentec.com ($995.00)

SmartNav   NaturalPoint.com ($499.00)

Head Mouse Downloads

- Uses a webcam to detect head movement

- Not as sensitive as commercial products, but improves with use of reflective dot

- Camera Mouse
  - www.cameramouse.org
  - For Windows
  - Free

PWC Mouse
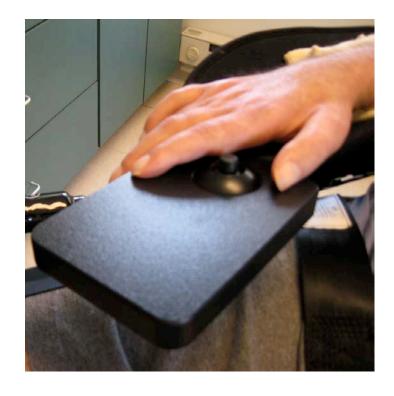
- Uses PWC joystick to control mouse
  - Advantages
    - Generally in PWC when using computer
    - Easy access
  - Disadvantages
    - Requires high end electronics
    - Adds another mode to wheelchair controls
    - Needs to be set-up by vendor
    - Does not always work

PWC Mouse

Smart Phone Access

- Uses mobile phone as mouse

- Apps
  - HippoRemote
    - Lite is Free
    - Pro is $4.99
  - Mobile Mouse
  - Remote Mouse
  - Touch Mouse

Virtual

- Scanning programs
  - A virtual line scans across the screen on one axis then the next.
  - The individual hits the switch when choice is highlighted
  - ScanBuddy ($131.00)
  - DiscoverPro 2.3 ($398.00 +IntelliSwitch)
  - SwitchXS for Mac ($299.00)
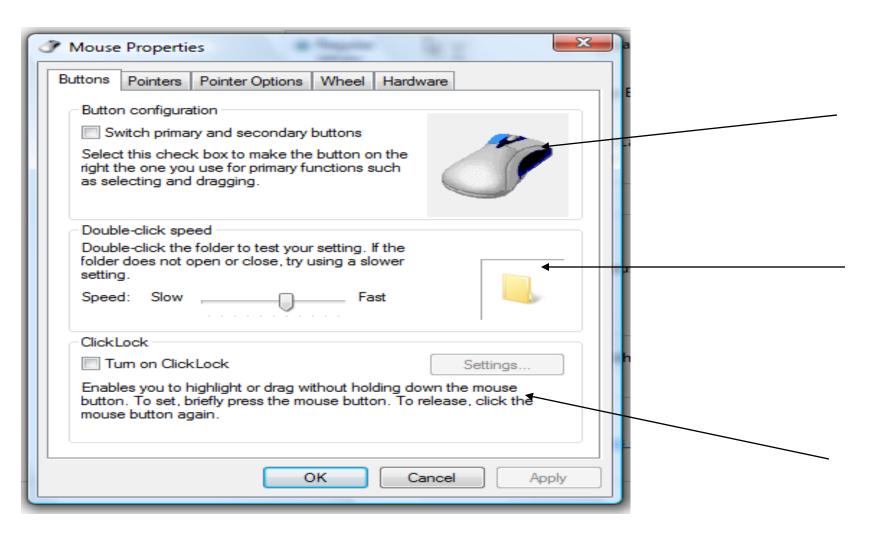
Difficulty with the mouse click

- System options
  - Mouse
    - Switch left and right click
    - Change mouse position

- External options
  - Alternate mouse
  - Keyboard mouse keys
  - Switch

- Virtual/hover
  - Dwell

Mouse options

Mouse Keys
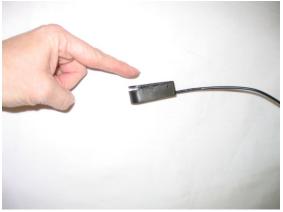
Switches

Cap ($69.00)

Micro Light ($77.00)

Pillow ($115.00)

ablenetinc.com

Mercury Tilt ($55.00)

Scatir ($590.00)

Interface between switches and computer

- Attaches to the computer with the USB connector. Then the switch is plugged into the opposite side of the base.

Swifty
($80.00)
www.orin.com/access/swifty

Switch Click
($139.00)
ablenetinc.com

How the switch is used
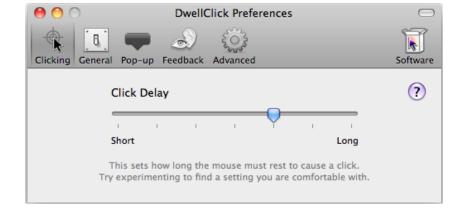
- Direct selection

  – Move the mouse by alternate means then hit switch when cursor is on target

- Scanning mode

  – Program scans across choices then hit switch when choice is highlighted

    - ScanBuddy ($131.00)
   - DiscoverPro 2.3 ($398.00 +IntelliSwitch)
    - SwitchXS for Mac ($299.00)
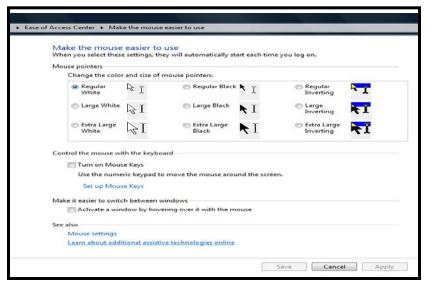
No click options
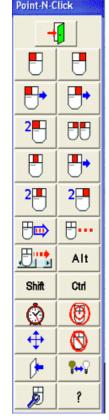
- Dwell

- Hover

Dwell Click App on Mac

Hover feature in Windows

Point N Click
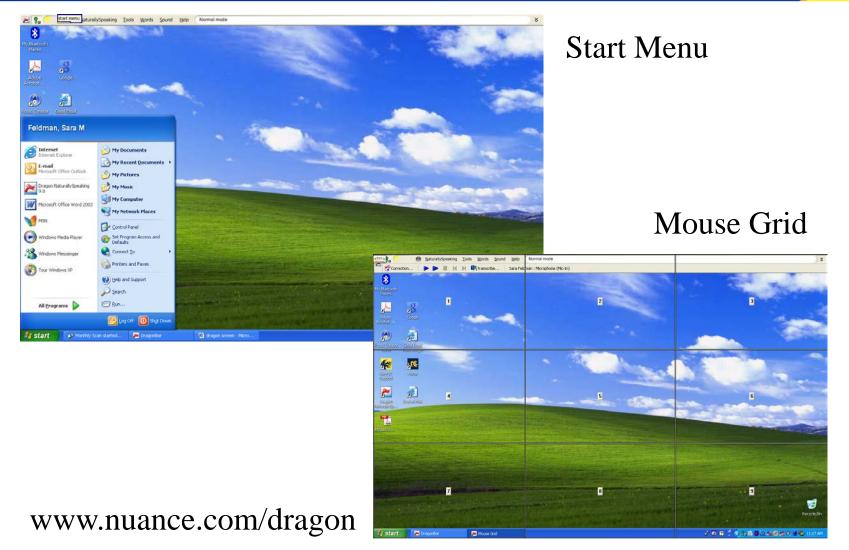
Voice Activation/ Speech Recognition

- Uses vocal commands to control the computer
- Most common
  - Dragon Naturally Speaking ($100.00-$180.00)
  - Voice Activated Commands in Windows/Mac
- Advantages
  - Relatively inexpensive
  - Fairly easy to use
- Disadvantages
  - Loss or change in speech
  - Microphones

Dragon Naturally Speaking

Start Menu

Mouse Grid

www.nuance.com/dragon
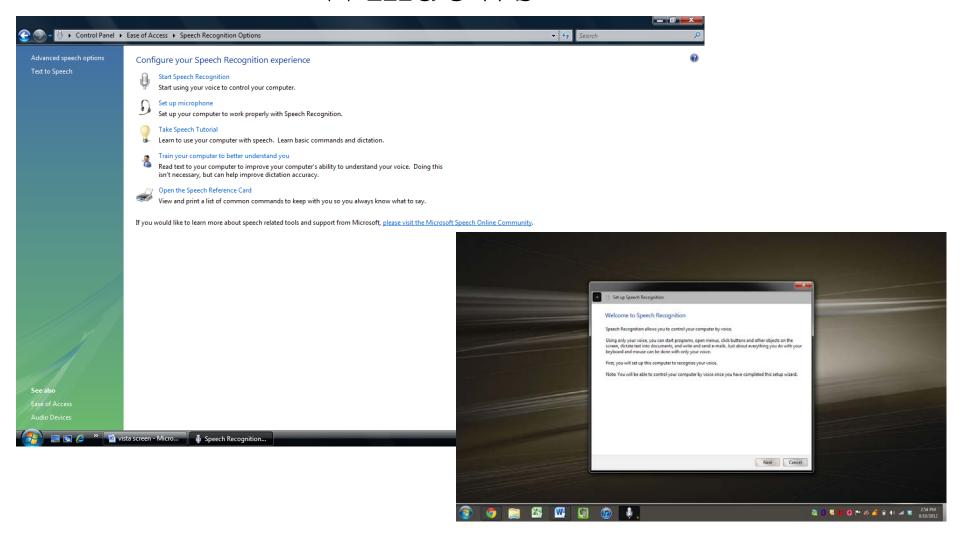
Speech Recognition
Windows

Speech Recognition Mac
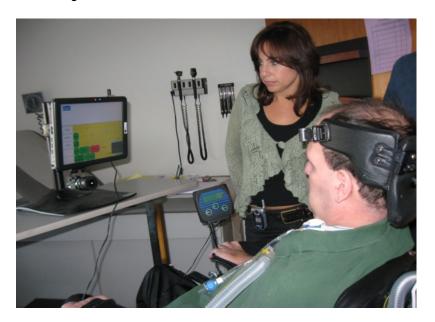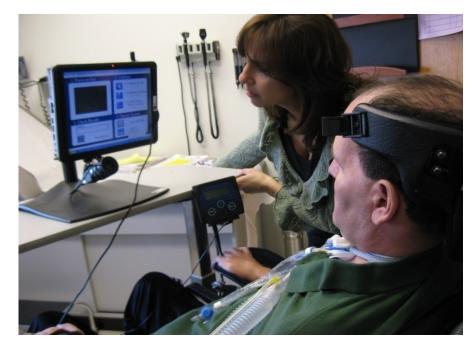
Eye tracking

- In eye tracking systems, the sensor is attached to the monitor and it reads the eye movement.

- Click is provided by an eye blink or a dwell.

Dynavox
MyTobii   ~$17,000.00
LCTechnologies

Eye tracking

- Eye Tech eye tracker attaches to your own computer

- www.eyetechaac.com

- $7000.00

TM4

iPad Access

- Virtual keyboard
  - Adapt stylus
  - Gloves
- Voice activated features
  - Still need to be able to press on/off
- Blue tooth scanning available
  - Actual App needs to be enabled, can not scan Home Screen or across apps

iPad Access

Home screen

Gloves

iPad Access

Stylus

Blue2 Bluetooth switch
www.ablenet.inc
($149.00)

Putting it together

- Difficulty with the keyboard
  - Start with StickyKeys.
  - Then the On-Screen keyboard
- Difficulty with the standard mouse
  - Try a different style mouse, maybe a head mouse.
  - Click with switch or dwell.
- Both are too difficult
  - Is voice activated an option?
  - Is eyegaze an option

Example Mr. S

- Issues
  - Fatigues with typing on keyboard
  - Trouble with left click
  - Hand function is Fair
  - Voice is Good
  - Uses PWC
- Options
  - On Screen keyboard
  - Reversed mouse buttons to click
  - Writes out emails by voice recognition
  - Was considering using power wheelchair joystick

Example Mr. B

- Issues
  - Good head control but otherwise quadriplegic
  - Good voice but uses NIV
- Options
  - Uses head mouse with Point N Click
  - On-screen keyboard

Example Mr. C

- Progression
  - On-screen keyboard and standard mouse
  - Changed mouse to joystick
  - Then head mouse and micro switch
  - Finally, eye gaze
  - Research with Brain Computer Interface

Multi-disciplinary Team

Speech Therapy

Occupational Therapy

Physical Therapy

Acknowledgments

- Thanks to the individuals with ALS/MND who constantly challenge me to keep up with the technology

- Dr. Terry Heiman-Patterson

- Rehab team
  - Mark Goren OT
  - Donna Harris SLP
  - Lauren Scull Biomedical Engineer/Research Associate

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- Kevin O'Donnell Independent Living Initiative

Questions?

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