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

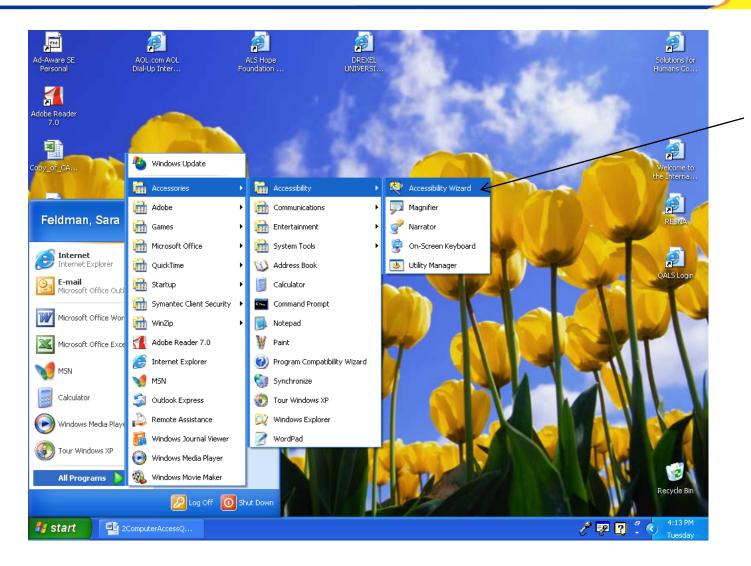


Difficulty using the standard keyboard

- Difficulty using the standard mouse
 - Cursor
 - Click

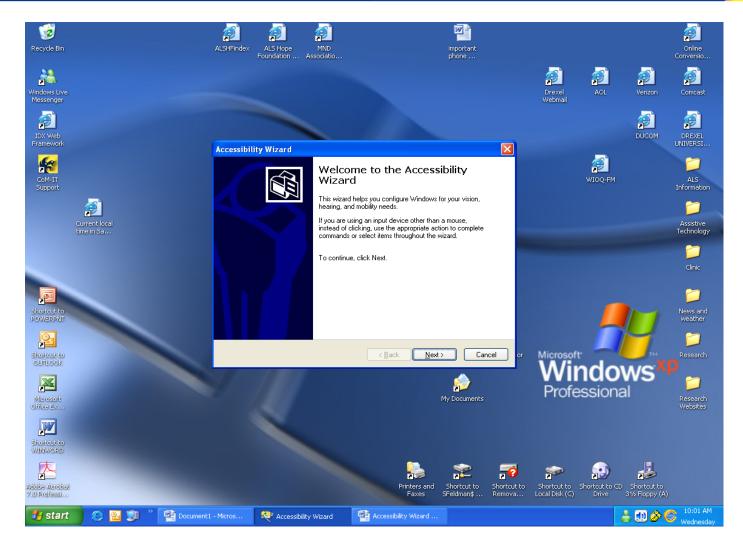
Difficulty with both

Accessibility in Windows XP

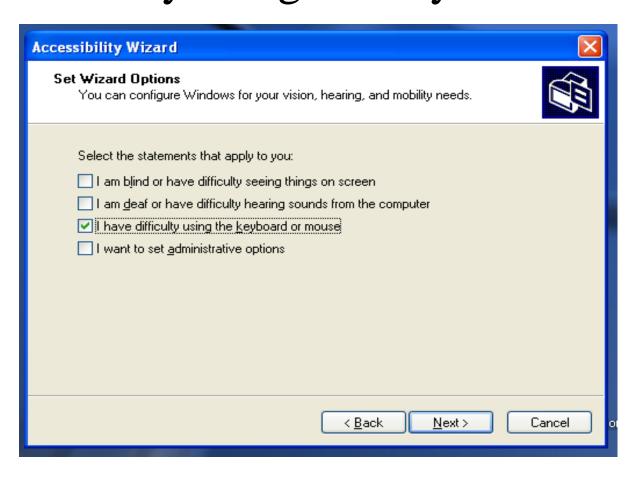


Accessibility Wizard



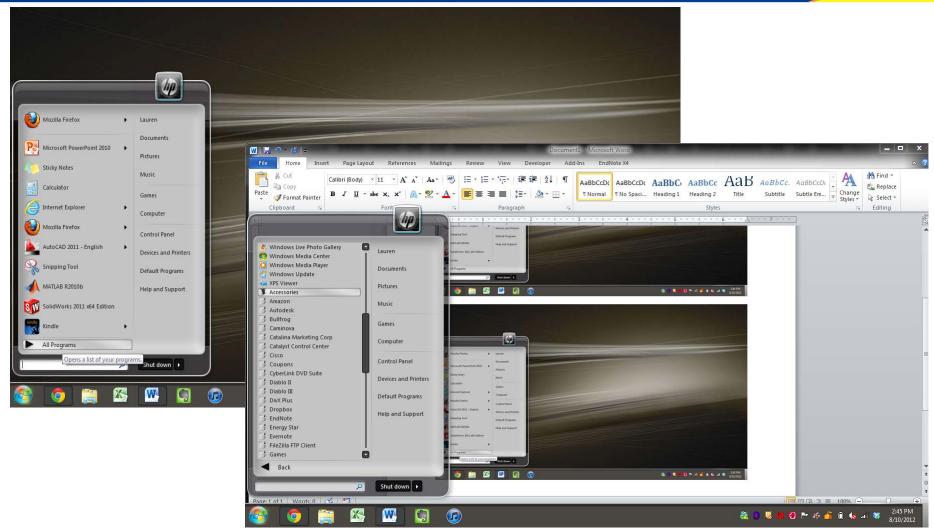


For the keyboard or mouse, choose "I have difficulty using the keyboard or mouse"



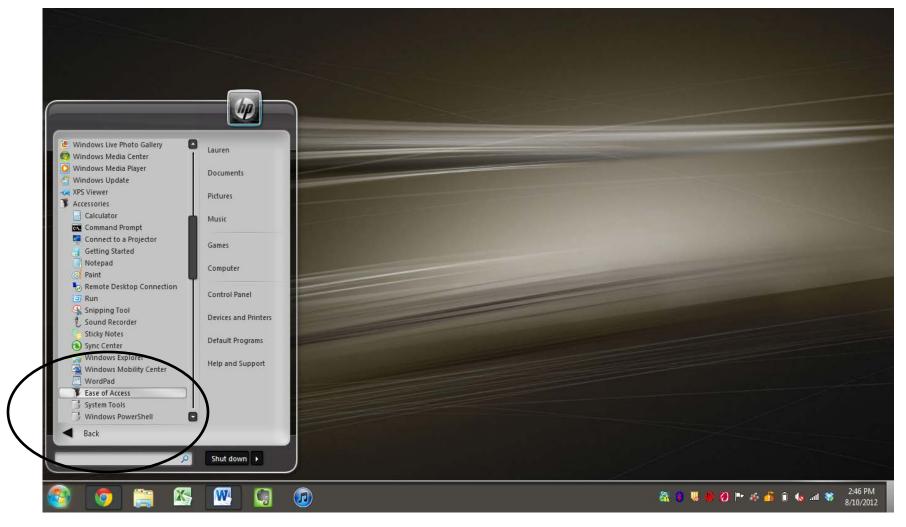
Accessibility in Windows





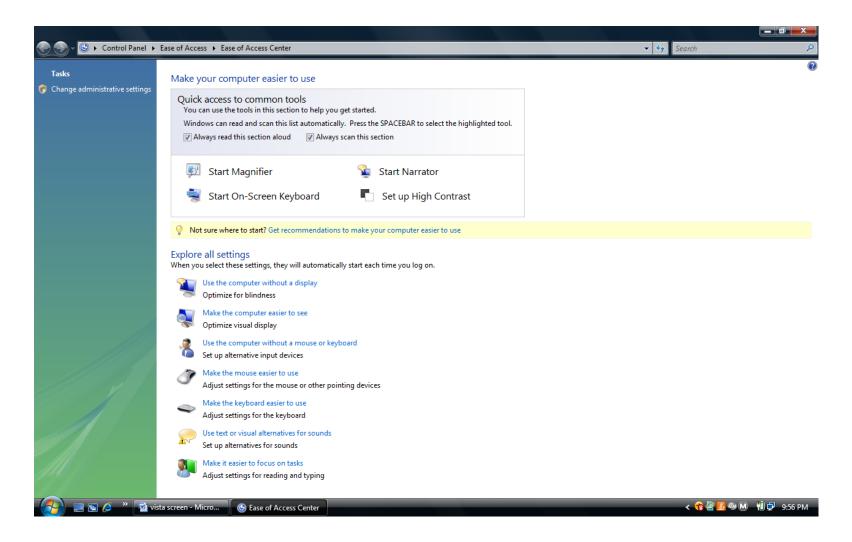
Ease of Access





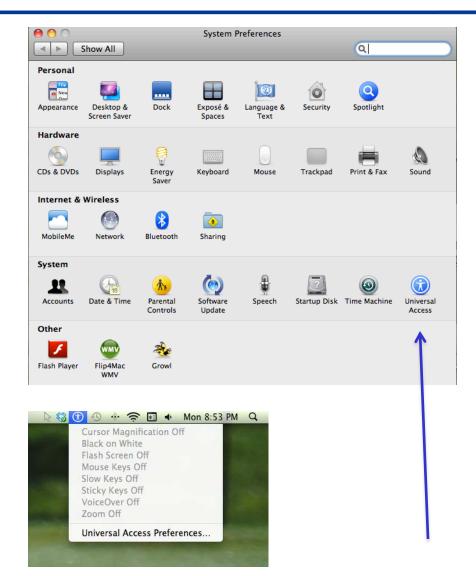
Ease of Access Center





Universal Access on Mac





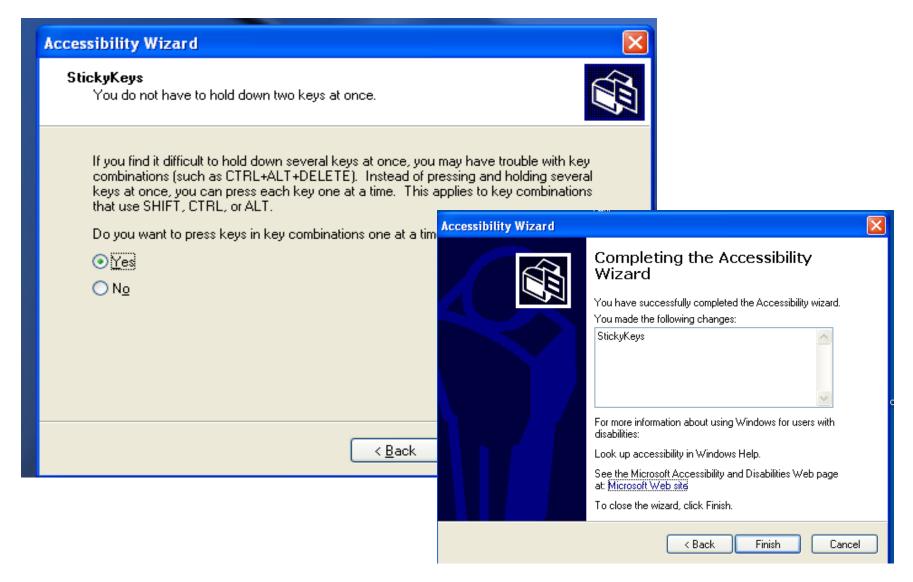
| 00 | Universal Access | |
|--------------------|---|-----|
| Show All | Ql | |
| When using this co | omputer, I would like assistance with: | |
| | Seeing Hearing Keyboard Mouse | |
| | | |
| For difficulties p | pressing more than one key at a time | |
| | Sticky Keys: On Off | |
| | Treats a sequence of modifier keys as a key combination. | |
| | Press the Shift key five times to turn Sticky Keys on or off | |
| | ■ Beep when a modifier key is set | |
| | ☑ Display pressed keys on screen | |
| For difficulties v | vith initial or repeated keystrokes | |
| | Slow Keys: On Off | |
| | Puts a delay between when a key is pressed and when it is accepted. | |
| | ☑ Use click key sounds | |
| | Acceptance Delay: | |
| | Long Short | |
| Key repeat de | elay can be set or turned off in Keyboard preferences: Set Key Repeat | |
| | | |
| | | 0 |
| | | (?) |
| ▼ Enable access | for assistive devices | |
| | or applicate activities | |
| ✓ Show Universa | Access status in the menu bar | |

Difficulty with standard keyboard

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

StickyKeys





Keyboard help in Windows



| ← | ▼ 🏰 Search |
|--|---------------------------|
| Make the keyboard easier to use When you select these settings, they will automatically start each time you log on. | |
| Control the mouse with the keyboard— | |
| Turn on Mouse Keys | |
| Use the numeric keypad to move the mouse around the screen. | |
| Set up Mouse Keys | |
| Make it easier to type | |
| Turn on Sticky Keys | |
| Press keyboard shortcuts (such as CTRL+ALT+DEL) one key at a time. | |
| Set up Sticky Keys | |
| ☐ Turn on Toggle Keys | |
| Hear a tone when you press CAPS LOCK, AHM LOCK, or SCROLL LOCK. | |
| ▼ Turn on Toggle Keys by holding down the NUM LOCK key for 5 seconds | |
| ☐ Turn on Filter Keys | |
| Ignore or slow down brief or repeated keystrokes and adjust keyboard repeat rates. | |
| Set up Filter Keys | |
| Make it easier to use keyboard shortcuts— | |
| Underline keyboard shortcuts and access keys | |
| See also | |
| Add a Dvorak keyboard and change other keyboard input settings | |
| Keyboard settings | |
| <u>Learn about additional assistive technologies online</u> | |
| | |
| | |
| Save Cancel Apply | |
| | < 😙 👺 🙆 🐠 🕪 🖷 🗗 🗗 9:58 PM |

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

JMZ

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



Dorsal wrist support (\$33.00 -\$45.00)

North Coast Medical www.ncmedical.com



Universal cuff (\$12.00)

Alternate Virtual Keyboards

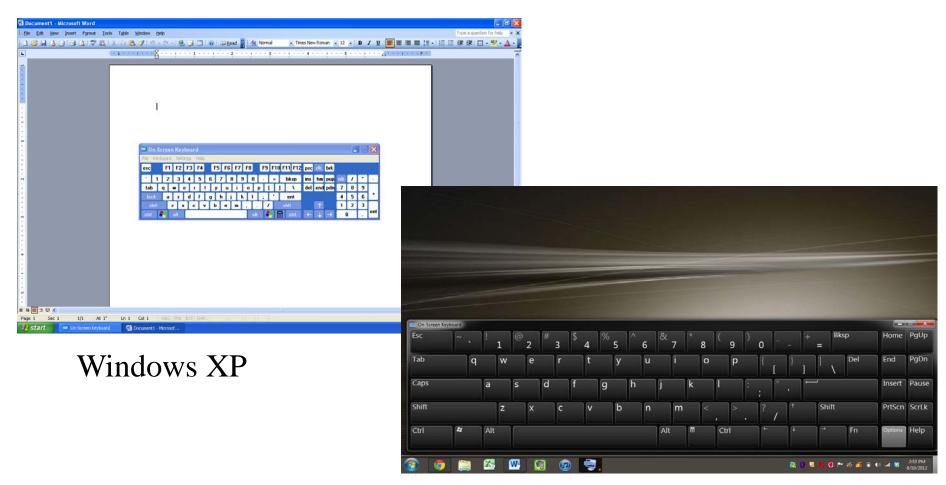


- On-Screen as part of Windows
- Keyboard Viewer on Mac
- Down-loads
 - Click N Type
 - Free Virtual Keyboard
- Dasher

On-Screen Keyboard

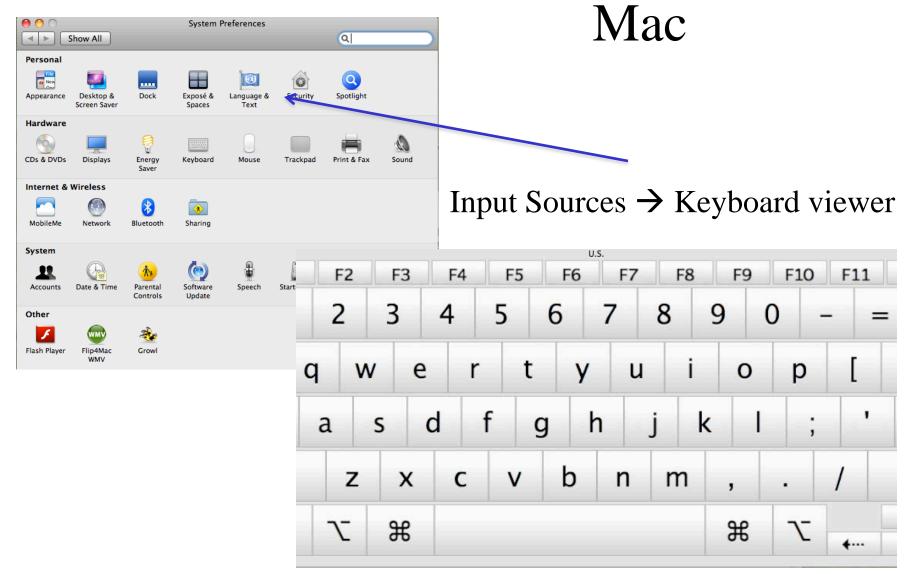


Microsoft



On-screen Keyboard





On-screen Keyboards



Downloads



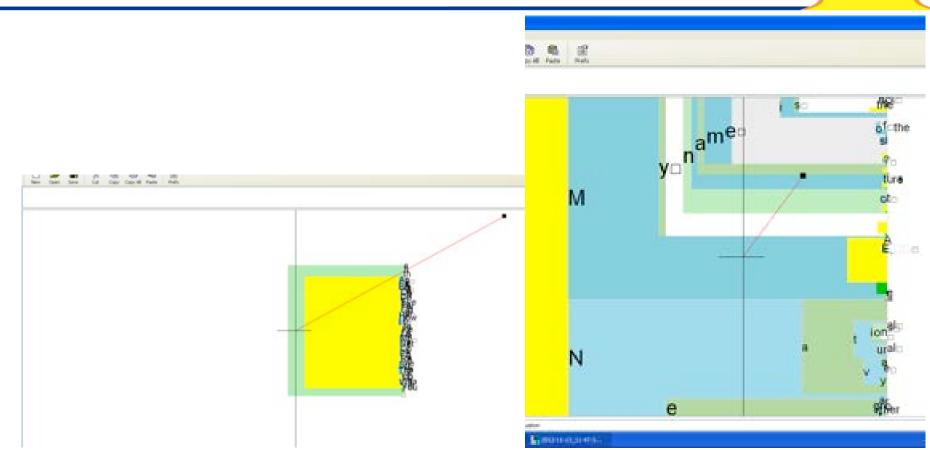
Click-N-Type cnt.lakefolks.com



Free Virtual Keyboard Freevirtualkeyboard.com

Dasher





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

Difficulty with the mouse cursor

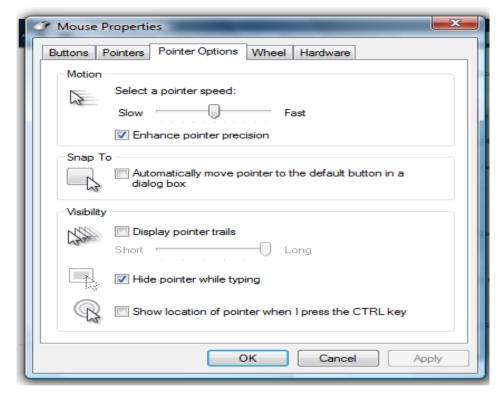
my

- 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



| Change the color and size of mouse pointers. Regular Regular Black I Regular Inverting Large White Large Black I Extra Large White Black Black I Extra Large White Extra Large Black I Extra Large White Slack Black I Extra Large Inverting I Extra Large White Slack Black I Extra Large Inverting I Extra Large White Slack I Extra Large Black I Extra Large Inverting I Extra Large Black I Extra Large Slack I Extra Large Inverting I Extra Large Black I Extra Large Inverting I Extra Large Black I Extra Large Inverting I Extra Large I Ex | • | elect these | | use ey will automatically st | art each tim | e you log on. | |
|--|-----------------|-------------|----------------|---------------------------------|--------------|---------------|----|
| Regular White Large White Large White Large Black Extra Large White Extra Large White Extra Large White Turn on Mouse Keys Use the numeric keypad to move the mouse around the screen. Set up Mouse Keys Make it easier to switch between windows Activate a window by hovering over it with the mouse See also Mouse settings | | | 1: 6 | | | | |
| White Large White Large White Extra Large White Extra Large White Extra Large White Extra Large Hack Extra Large Hack Extra Large Inverting Extra Large Inverting Turn on Mouse Keys Use the numeric keypad to move the mouse around the screen. Set up Mouse Keys Make it easier to switch between windows Activate a window by hovering over it with the mouse See also Mouse settings | | | | • | | | |
| Extra Large White Extra Large Black Extra Large Inverting Control the mouse with the keyboard Turn on Mouse Keys Use the numeric keypad to move the mouse around the screen. Set up Mouse Keys Make it easier to switch between windows Activate a window by hovering over it with the mouse See also Mouse settings | | | ß I | Regular Black | , I | | T |
| Control the mouse with the keyboard Turn on Mouse Keys Use the numeric keypad to move the mouse around the screen. Set up Mouse Keys Make it easier to switch between windows Activate a window by hovering over it with the mouse See also Mouse settings | ○ Larg | ge White | βI | Large Black | ∤ I | | FI |
| ☐ Turn on Mouse Keys Use the numeric keypad to move the mouse around the screen. Set up Mouse Keys Make it easier to switch between windows ☐ Activate a window by hovering over it with the mouse See also Mouse settings | | | /I | | ∤ I | | ΥĪ |
| Set up Mouse Keys Make it easier to switch between windows Activate a window by hovering over it with the mouse See also Mouse settings | | | • | ard — | | | |
| Make it easier to switch between windows Activate a window by hovering over it with the mouse See also Mouse settings | Use | the nume | ric keypad to | move the mouse arou | ınd the scre | en. | |
| ☐ Activate a window by hovering over it with the mouse See also Mouse settings | Set | up Mous | e Keys | | | | |
| See also — Mouse settings | Make it easie | er to switc | h between v | vindows — | | | |
| Mouse settings | Activ | ate a win | dow by hove | ering over it with the m | ouse | | |
| | See also | | | | | | |
| Learn about additional assistive technologies online | Mouse | settings | | | | | |
| | <u>Learn al</u> | bout addi | tional assisti | ve technologies online | | | |



Alternate mouse options





Remote or wireless (\$25.00-\$50.00)



Trackball (\$20.00-\$50.00)



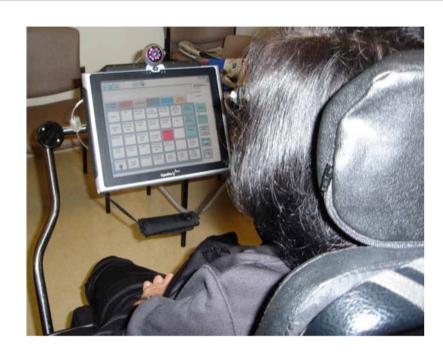
www.logitech.com



Touch pad (\$80.00)

Head Mouse (Commercial)





Tracker Pro Madentec.com (\$995.00)

SmartNav NaturalPoint.com (\$499.00)

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



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

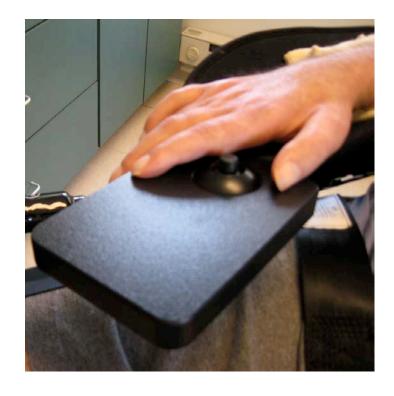


- Uses PWC joystick to control mouse
 - Advantages
 - Generally in PWC when using computer
 - Easy access
 - Disadvantages
 - Requires high end electronics
 - Adds another mode to wheelchair controls
 - Needs to be set-up by vendor
 - Does not always work

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)

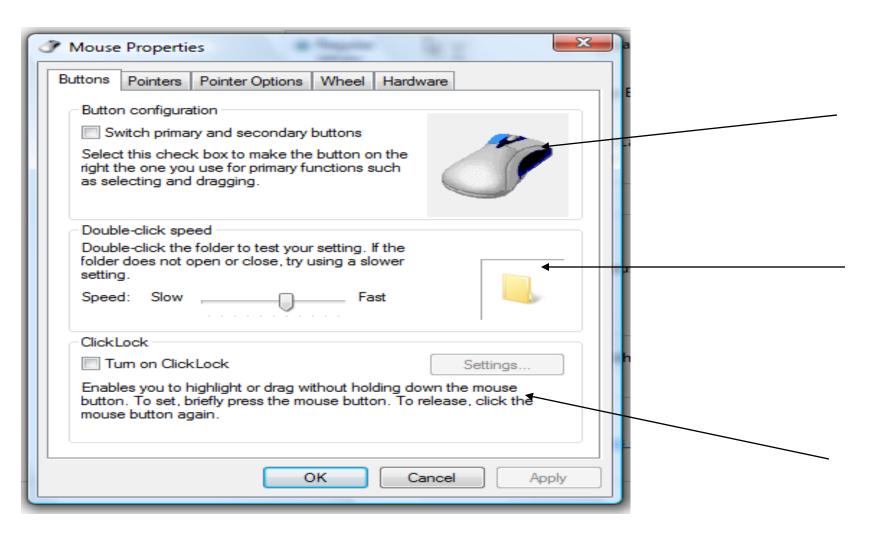
Difficulty with the mouse click



- 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



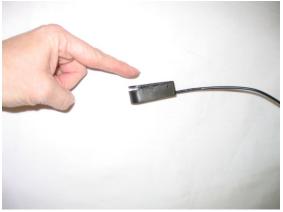
| Make the mouse easier to use |
|---|
| When you select these settings, they will automatically start each time you log on. |
| Mouse pointers |
| Change the color and size of mouse pointers. |
| |
| ○ Large White ○ Large Black Inverting |
| © Extra Large |
| Control the mouse with the keyboard |
| Turn on Mouse Keys |
| Use the numeric keypad to move the mouse around the screen. |
| Set up Mouse Keys |
| Make it conjecto switch between mindows |
| Activate a window by hovering over it with the mouse |
| See also |
| Mouse settings |
| Learn about additional assistive technologies online |

Switches





Cap (\$69.00)



Micro Light (\$77.00) Pillow (\$115.00)





Mercury Tilt (\$55.00)



Scatir (\$590.00)

ablenetinc.com

Interface between switches and

Attaches to the computer

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

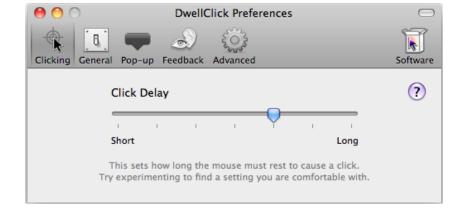


- Direct selection
 - Move the mouse by alternate means then hit switch when cursor is on target
- Scanning mode
 - Program scans across choices then hit switch when choice is highlighted
 - ScanBuddy (\$131.00)
 - DiscoverPro 2.3 (\$398.00 +IntelliSwitch)
 - SwitchXS for Mac (\$299.00)

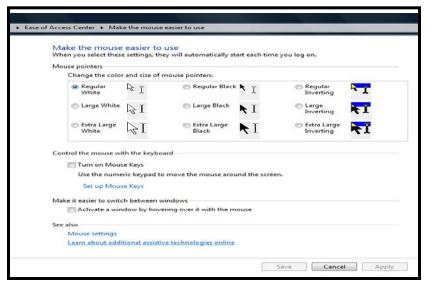
No click options



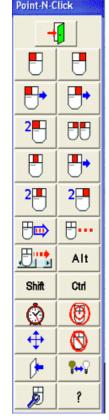
• Dwell



Hover



Dwell Click App on Mac



Point N Click

Hover feature in Windows

Voice Activation/

June

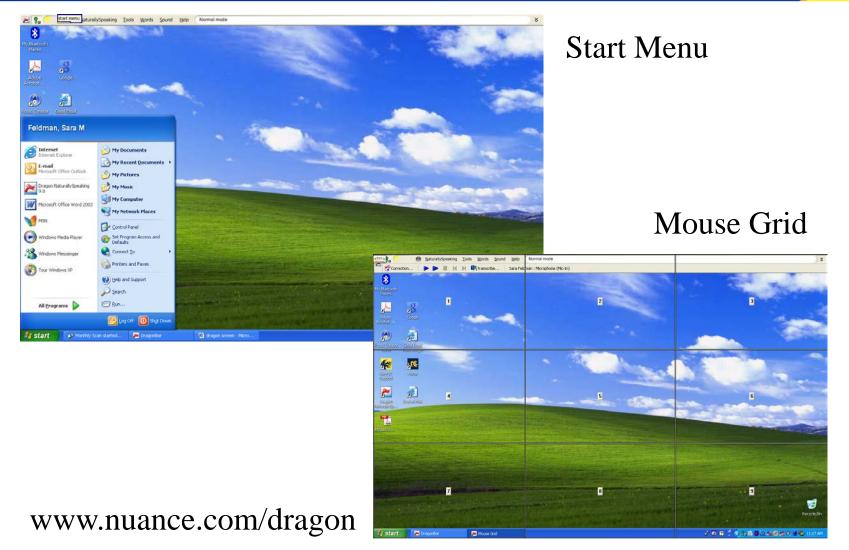
Speech Recognition

- 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

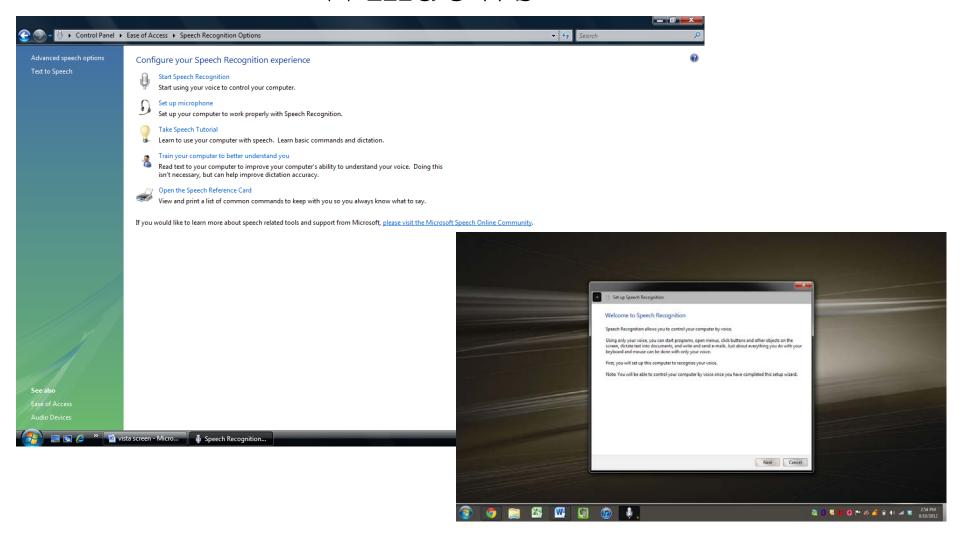




Speech Recognition



Windows



Speech Recognition



Mac

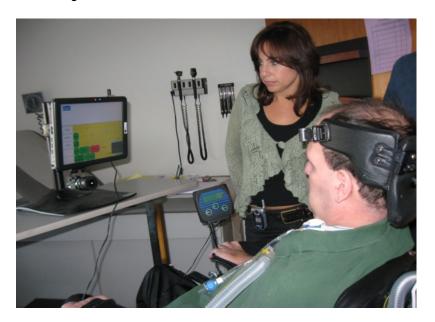


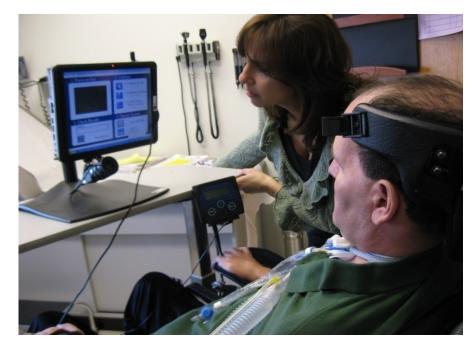
| 0 0 | Speech | |
|----------|--|---|
| → | Show All | |
| | | |
| | Speech Recognition Text to Speech | |
| | Speakable Items: On • Off | |
| | Settings Commands | |
| | Microphone: Internal microphone Calibrate | |
| | Listening Key: Esc Change Key | |
| | Listening Method: O Listen only while key is pressed | |
| | Listen continuously with keyword | |
| | Keyword is: Required before each command 🛟 | |
| | Keyword: Computer | |
| | Upon Recognition: Speak command acknowledgement | |
| | Play this sound: Whit | ? |
| | | |
| | | |

Eye tracking

June

- 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









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 BrainComputer Interface



Multi-disciplinary Team





Occupational Therapy





Speech Therapy



Physical Therapy

Acknowledgments

- JMZ
- 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
- Christopher Reeve Foundation
- Kevin O'Donnell Independent Living Initiative



Questions?





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