

Tablet PC

CSE 490 RA

Key features

- Form factor
 - Size
 - Mobility
- Pen Input
 - Natural Ink
- Stand Alone
- General Purpose

Tablet PC History

- GRiDPad 1989
- Go Pen point 1991
- Pen Windows 1992
- Newton 1993
- Palm Pilot 1996

Tablet PC Hardware Requirements

- Digitizer
 - Detect Hovering Pen
 - Sample at least 100 times per second
 - Support resolution of 600 dpi
- Two second resume from standby
- Landscape to portrait without reboot
- Ctrl-alt-del without keyboard

Why might pen computing succeed?

- Dramatic changes in hardware
 - Digitizers
 - CPU Speeds
 - Batteries
- Digital Ink Recognition
 - This presentation was created without a keyboard on a turbulent airplane
- Digital Ink treated as first class type

TPC Software

- Digital Ink Applications
- Ink SDK
- Tablet Input Panel
 - Computing without the keyboard
- Extension of Windows XP
 - Must run windows apps

Hardware landscape

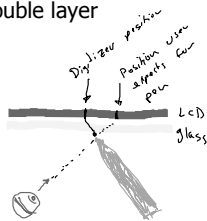
- Many vendors
- Range of form factors
- What about the keyboard?
- Laptop plus vs. slate
 - Convertible
 - Acer, Toshiba
 - Detachable keyboard
 - HP/Compaq, motion computing

Usability Studies

- Pen UI vs. Conventional Windows UI
- Ink as ink
 - User studies showed that often users do not convert to handwriting
- Visual distinction for inkable regions
- Input Modality
 - Do actions change based on state
 - Many believe modeless UI's are desirable

Digitizer issues

- Digitizer types
 - Resistive, single or double layer
 - Electro-static
 - Electro-magnetic
- Digitizer distortion
- Parallax



Pen usability


- Targeting
 - MS determined that .5cm is minimum
 - Many controls are smaller
 - Domains with much larger targeting range
 - Walking or talking
 - Bumpy airplane
- Double click
- Tap without drag
- Hovering

Pen Types

- Magnetic or Battery powered
- May have button
- Some active at both ends
 - Supports natural eraser metaphor
-

Handedness

- Users hand blocks menu/cursor
- Left vs. Right
- Tablet PC controls take handedness into account
- Control Panel /Tablet and Pen settings / settings



Pen Actions

- Hover
- Tap
- Double Tap
- Press and Hold
- Hold through
- Drag
- Hold-Drag
- Lasso
- Gesture



Gestures

- Control actions associated with pen movements
- InkCollector / InkOverlay provide gesture support
 - Recognized gestures fire event
- Issues / risks
 - Hard to learn (as keyboard shortcuts)
 - Serious problem in accidental triggering