

# Informatics 134

Software User Interfaces  
Spring 2021

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# Agenda

1. Upcoming
2. Graphical Toolkits and Accessibility
3. References

# Upcoming

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## Upcoming

- Continue T3 Critiques today
- Begin lecture on accessibility
- Wrap up accessibility lecture on Thursday
- Introduce A4 on Thursday
- Keep working on A3 (DUE TONIGHT!!)
- Keep working on T3 (DUE EOQ, Critique 5/13)

## **Graphical Toolkits and Accessibility**

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**What is accessibility?**

# Accessibility

## Historical Perspective

Transition from the terminal to a GUI

Ushered in personal computing era  
(good)

Ushered in the accessibility era (not so  
good)



[Wikipedia, 2021, theverge.com, 2021]

# Accessibility

## Historical Perspective

Although millions of new people were now **able** to understand and make use of computational systems, millions of people were simultaneously **unable** to use and operate new graphical based systems.



[theverge.com, 2021]

# Accessibility

## The Graphical User Interface Crisis: Danger and Opportunity

“Our intuition tells that the more an interface is optimized for a person who can see, the less useful that computer will be to people who cannot see.”

——[Boyd et al., 1990]

# Accessibility

## Historical Perspective

According to [Boyd et al., 1990], the problem manifested in two major categories:

- 1 Perceptual: Screen rendering via pixels requires deciphering of graphical information
- 2 Control: Interaction with visual representations of information and manipulation and control of the flow of information



[theverge.com, 2021]

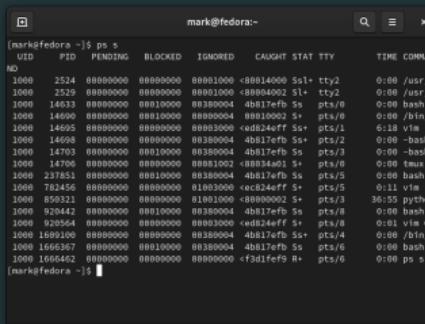
# Accessibility

## Historical Perspective

WIMP (?):

Transition from a concise command language

To visual metaphors – graphical representations of everyday objects



```
mark@fedora:~$ ps s
  PID  PPID  STAT   TT  TIME COMMAND
 1000    1    S+  0:00 /usr/r
 1000  2529    S+  0:00 /usr/r
 1000 14633    S+  0:00 bash
 1000 14690    S+  0:00 /bin/
 1000 14693    S+  0:00 bash
 1000 14698    S+  0:00 bash
 1000 14703    S+  0:00 bash
 1000 14850    S+  0:00 bash
 1000 23785    S+  0:00 bash
 1000 782456   S+  0:11 vim
 1000 859321   S+  36:55 python
 1000 920442   S+  0:00 bash
 1000 920564   S+  0:01 vim C
 1000 1189108   S+  0:00 bash
 1000 166462   S+  0:00 bash
 1000 166462   S+  0:00 ps s
```

[theverge.com, 2021]

# Accessibility

## Historical Perspective

Gaining Access: Enter the Screen Reader

IBM Screen Reader/DOS (1984)

IBM Screen Reader/2 (1986-1994)

...

IBM adapted early work on speech synthesis to create SAID, the Synthetic Audio Interface Driver [Thatcher, 1994].

# Accessibility

## Historical Perspective

### Gaining Access: Enter the Screen Reader

Early version of SR/2 relied on a separate custom keyboard to control speech synthesis to avoid system conflicts!

The key principle from Thatchers work was that text-based DOS and GUI are different interfaces for doing the same thing. So, the solution was to map GUI to textual equivalents [Thatcher, 1994].

“Abstract away what is *graphical* about the graphical user interface.”

# Accessibility

## Historical Perspective

From *access* to *degrees of access*

By mid-1990's focus changed to efficiency, coherence, exploration, and cost

Refinement of the abstraction – developing a consistent, reusable, lexical understanding of graphical widgets

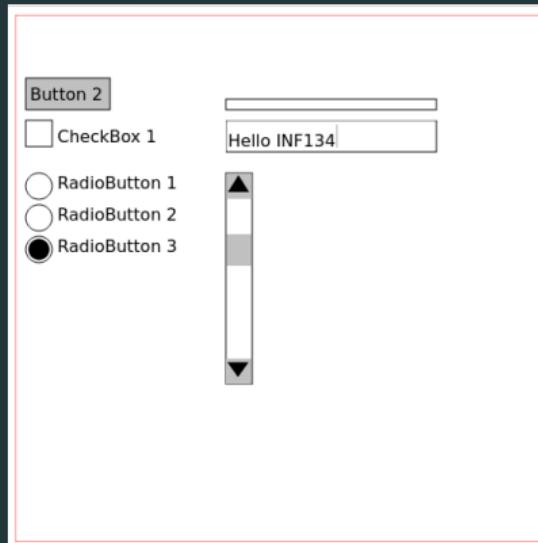
Locate widgets without a mouse, support exploration, interact without clicking

Consistent mental model (WHY?)

# Accessibility

## Historical Perspective

How would you describe your widgets?



The image shows a Linux desktop environment with a dark theme. On the left is a terminal window titled "Zulip - UCI INF134" displaying a conversation in the "# A3: Discussion and QA" stream. The conversation includes messages from users like Eduardo Magdaleno, Mark (Instructor), Brian Cantwell, and Chris Borja. On the right is a "Settings" window titled "Mouse & Touchpad" with several tabs and sections for configuring system input methods.

**Terminal Window (Left):**

- Title: Zulip - UCI INF134
- Stream: # A3: Discussion and QA
- Message 1: Eduardo Magdaleno (2020 PM)
  - I've been trying to access it all day.
- Message 2: Mark (Instructor) (2020 PM)
  - Well...that's unfortunate. Thanks for the web archive link Derek!
- Message 3: Brian Cantwell (11:09 PM)
  - try to use the documentation for more difficult now since the search bar doesn't function on the wayback machine copy
- Message 4: Brian Cantwell (11:10 PM)
  - It looks like the [zgpt.com](http://zgpt.com) domain was lost.
- Message 5: Chris Borja (11:11 AM)
  - Capture\_2020-05-18\_11-11-01.jpg has been working for me. It's faster and the search bar kind of works. You can search for just fine and the options that show up tell you where to navigate to find that function.
- Message 6: Mark (Instructor) (11:17 AM)
  - Work. What a mess. Yeah, looks like they forgot to renew the domain. The link that Chris posted won't just fire though.
- Message 7: For those curious, an issue has been posted.  
<https://github.com/zgpt/zgpt/issues/20>

**Settings Window (Right):**

- Title: Mouse & Touchpad
- General:
  - Primary Button: Sets the order of physical buttons (mouse and touchpads). Options: Left, Right.
- Mouse:
  - Mouse Speed: Sliders for "Work Speed" and "Natural Scrolling".
- Touchpad:
  - Touchpad: Sliders for "Natural Scrolling" and "Touchpad Speed".
  - Tap to Click
  - Two-finger Scrolling
  - Edge Scrolling
- Keyboard Shortcuts
- Printers
- Removable Media
- Color

**From *degrees of access* to *supporting access***  
**Continued on Thursday...**

## References

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