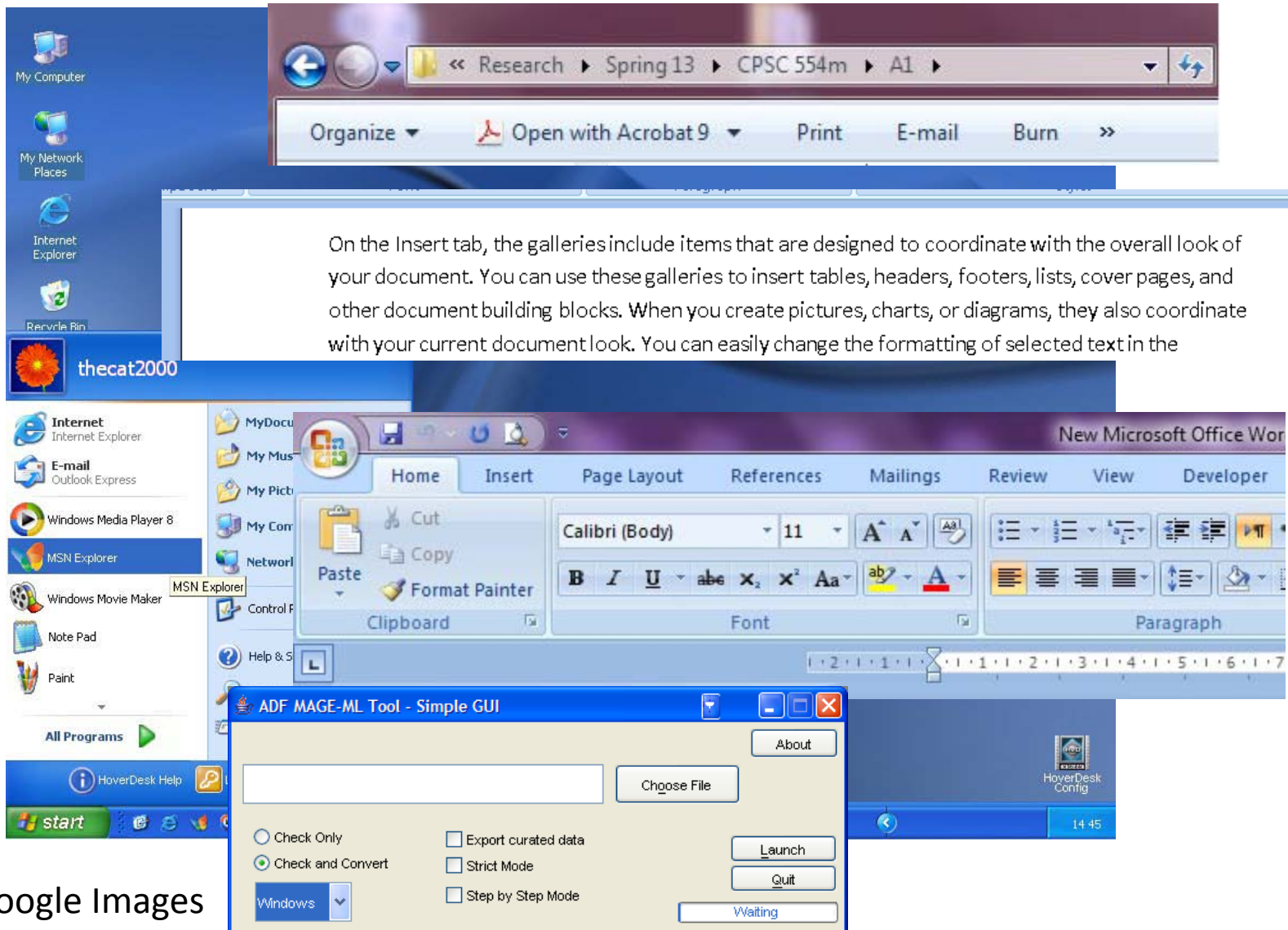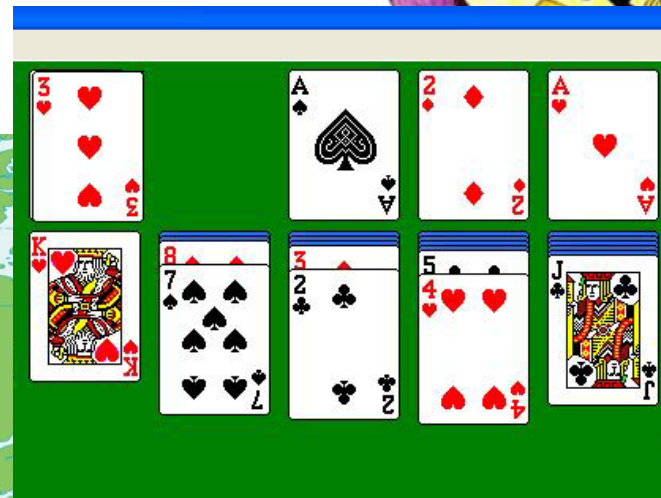# Graphical User Interfaces for Visually-Impaired Users
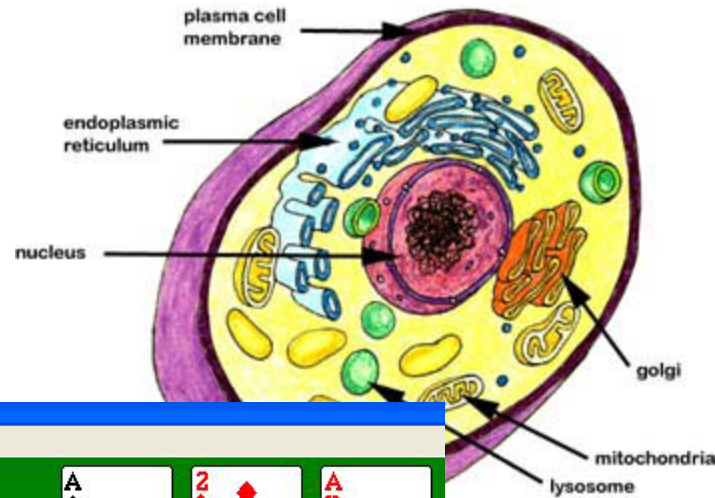
Hasti Seifi

CPSC 554m

Spring 2013

My Computer

My Network
Places

Internet
Explorer

Recycle Bin

thecat2000

« Research ▸ Spring 13 ▸ CPSC 554m ▸ A1 ▸

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Config

14 45

ADF MAGE-ML Tool - Simple GUI

About

Choose File

○ Check Only

◉ Check and Convert

Windows

☐ Export curated data

☐ Strict Mode

☐ Step by Step Mode

Launch

Quit

Waiting

From Google Images

2
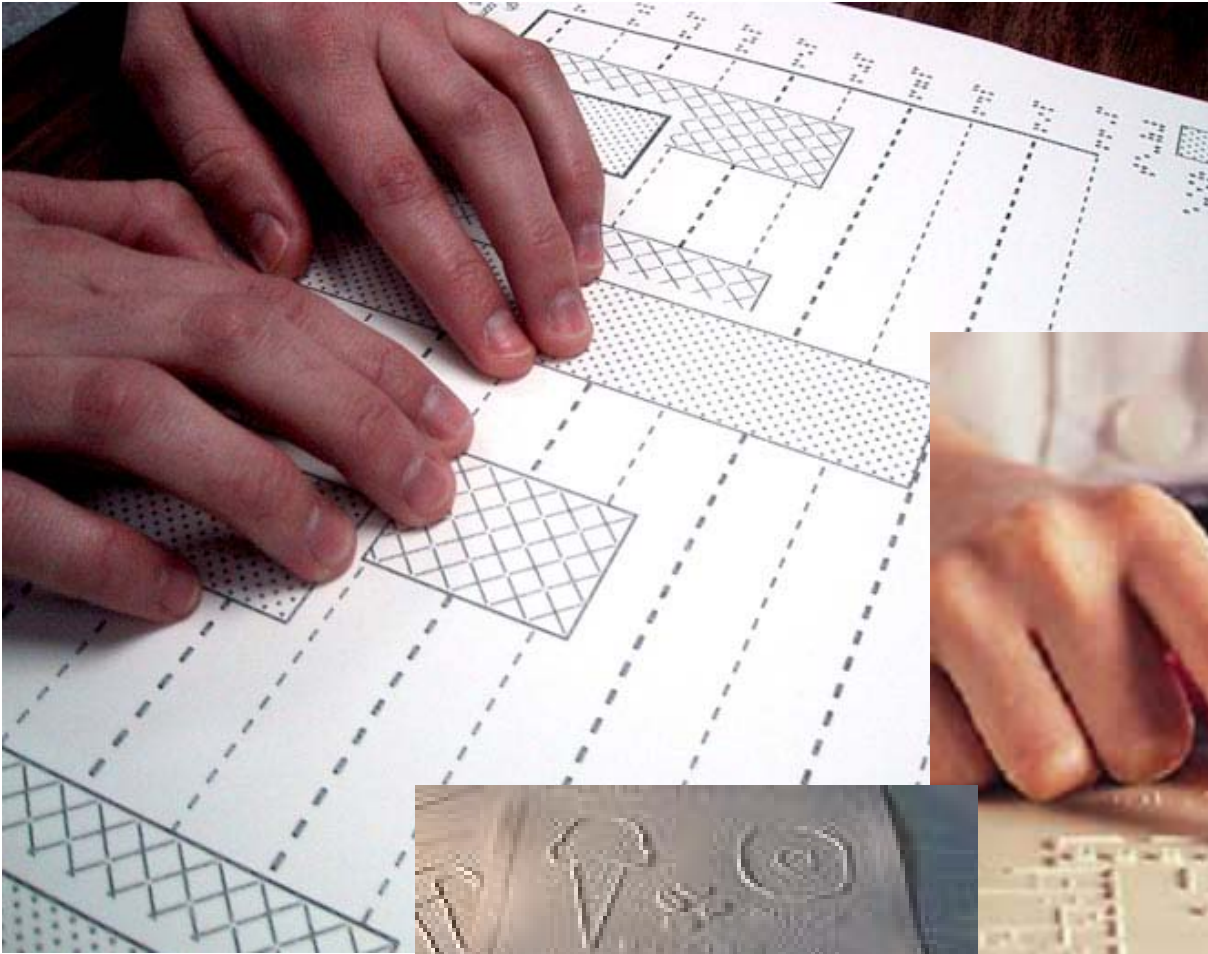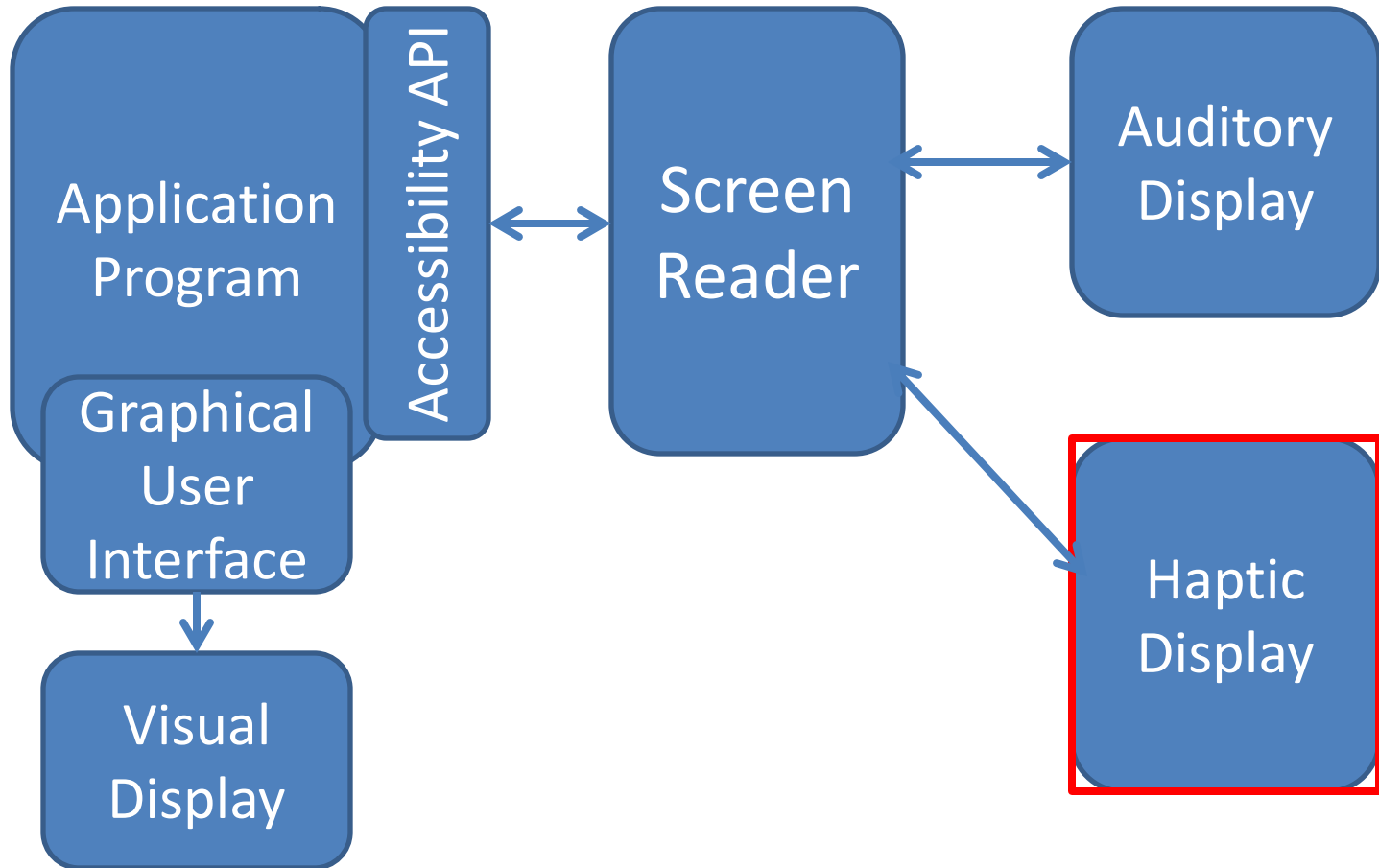
From Google Images

3

Tactile Graphics

From Google Images

How do visually-impaired people work with computers?

HAPTIC DEVICES FOR GRAPHICAL INTERFACES

Two Categories of Haptic Devices

- Force Feedback Devices

- Tactile Devices
  - Static Refereshable Displays
  - Dynamic Displays
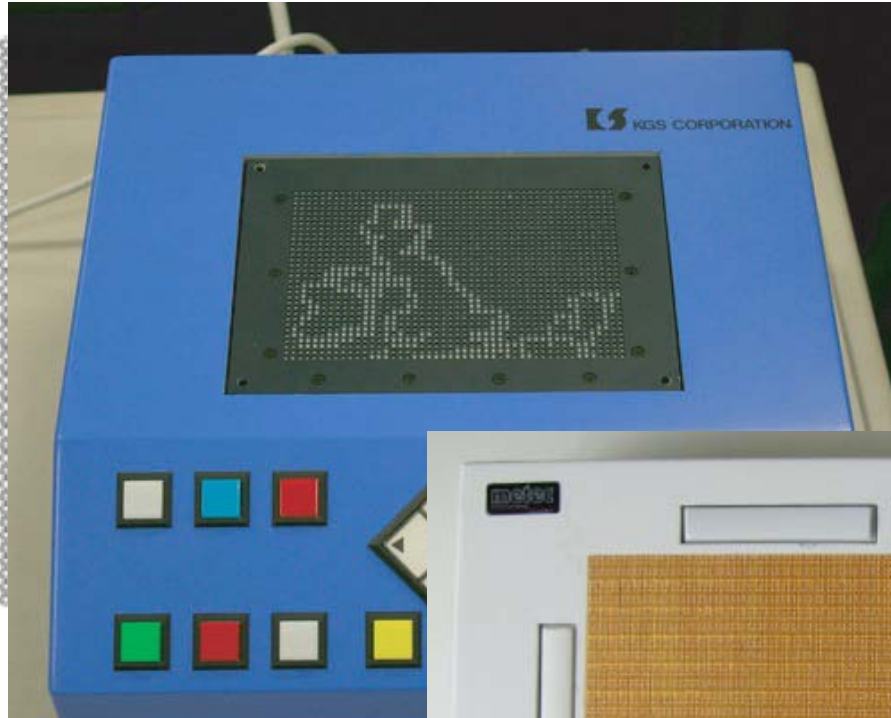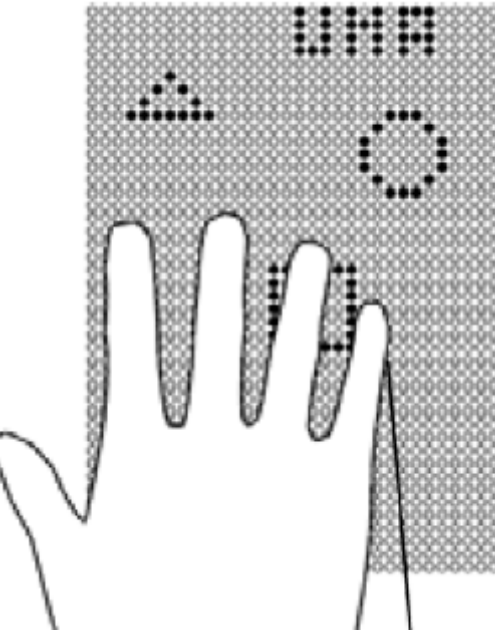
Force Feedback Devices
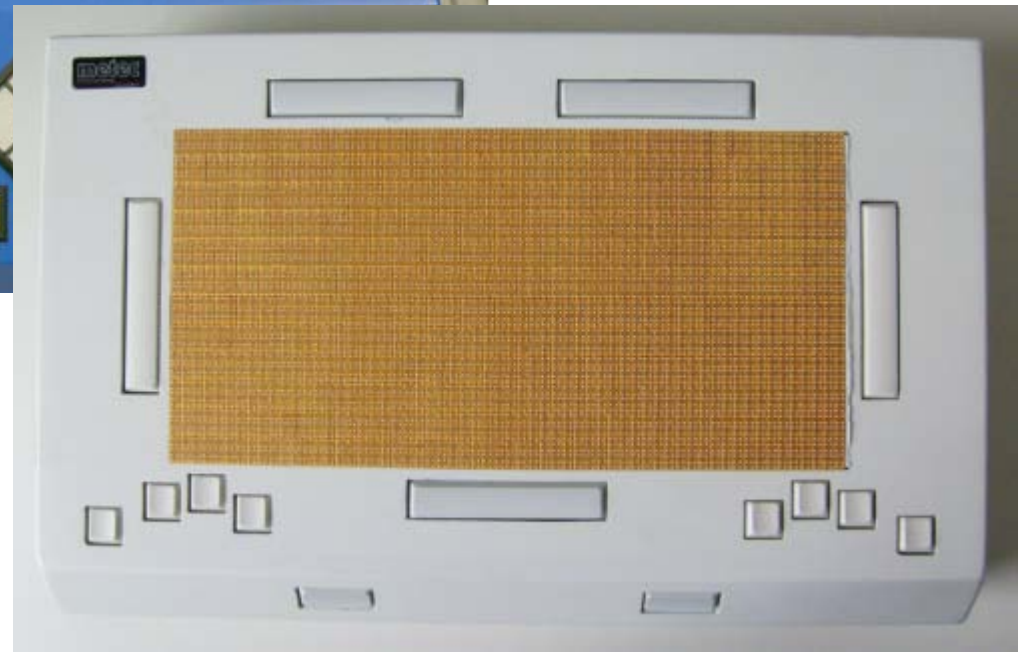

FEELit mouse

Joystick

Phantom

Tactile Devices
1. Static Refreshable Displays

From Shimada et al. 2008

From Vidal-Verdue and Hafez 2007

From Schiewe et al. 2009

Example Video

Interacting with Map

From hyperbraille.com

Tactile Devices
2. Dynamic Displays

From Vidal-Verdue
and Hafez 2007

From Levesque et
al. 2012

What do visually-impaired people use?

From Google Images

Availability, Cost, Application Programs

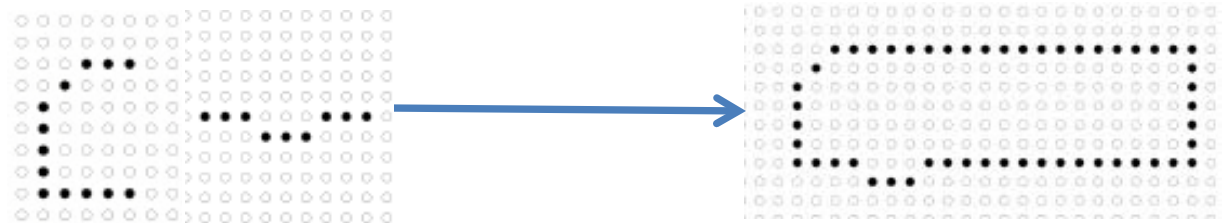# USABILITY CONSIDERATIONS
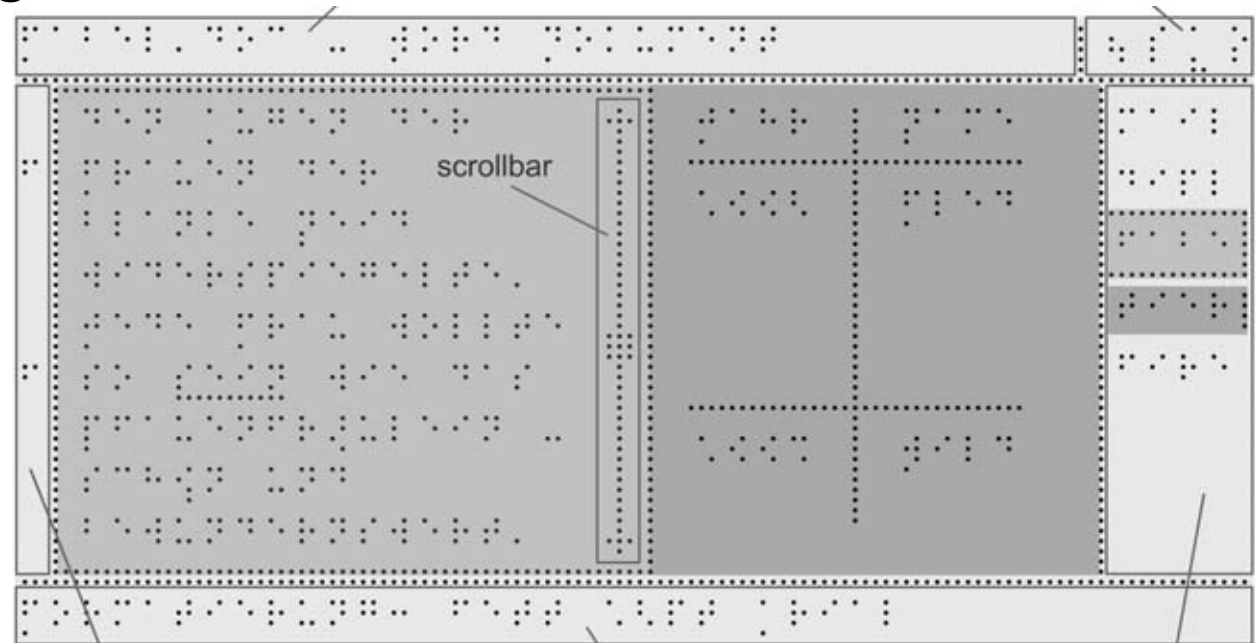
Usability Considerations

1) Touch Surfaces and Gestures

Example Video

Drawing Application

From hyperbraille.com

Usability Considerations- Cont.

2) UI Elements

scrollbar

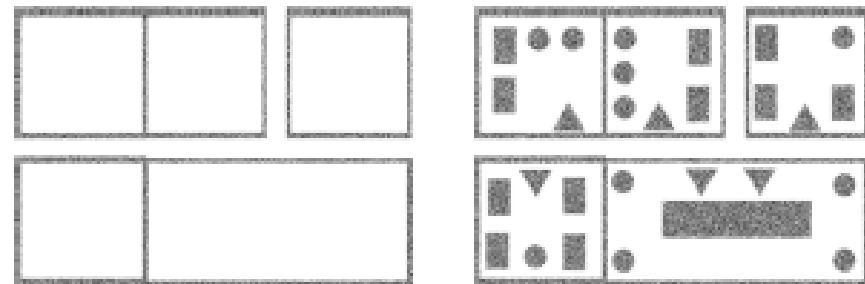**editable**   **openable**

Combo box

From Taras et. al. 2010

Usability Considerations-Cont.

3) Adaptive Level of Detail
  – Regions and stroking (skimming) for big static displays

  – Toggling level of detail

From Levesque et. al. 2012

Summary

- Graphics for visually-impaired users

- Research on the technology
  - Force feedback devices
  - Tactile devices

- Usability studies for tactile interfaces

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