

CHAPTER 8

Interaction Devices

أجهزة التفاعل

**Keyboard
Layouts**

تخطيطات لوحة
المفاتيح

**Pointing
Devices**

أجهزة التآشير

**Novel
devices**

الاجهزه الجديدة

**Speech and
auditory
interfaces**

واجهات النطق والسمع

**Displays – Small
and Large**

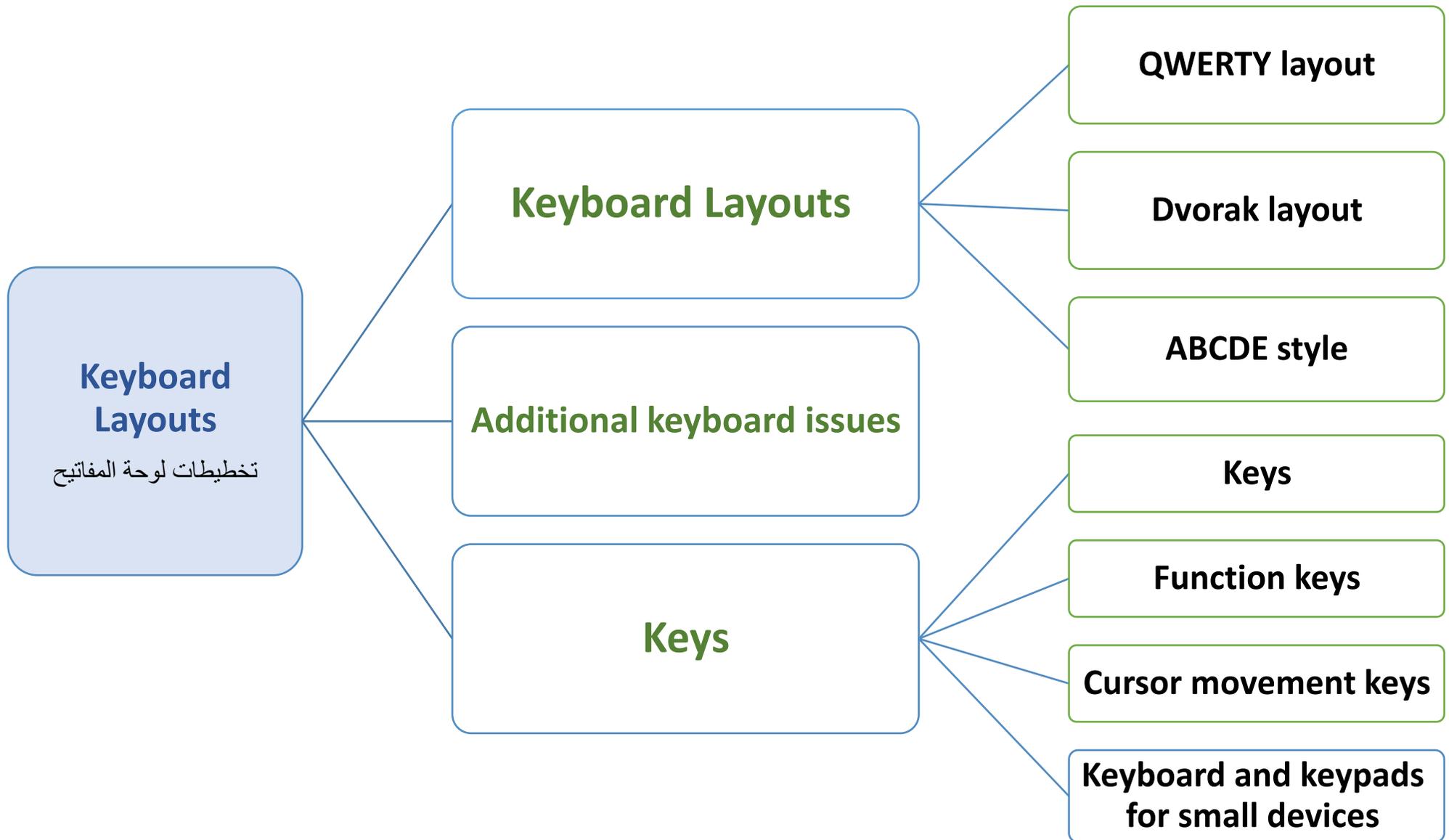
العروض الكبيرة
والصغيرة

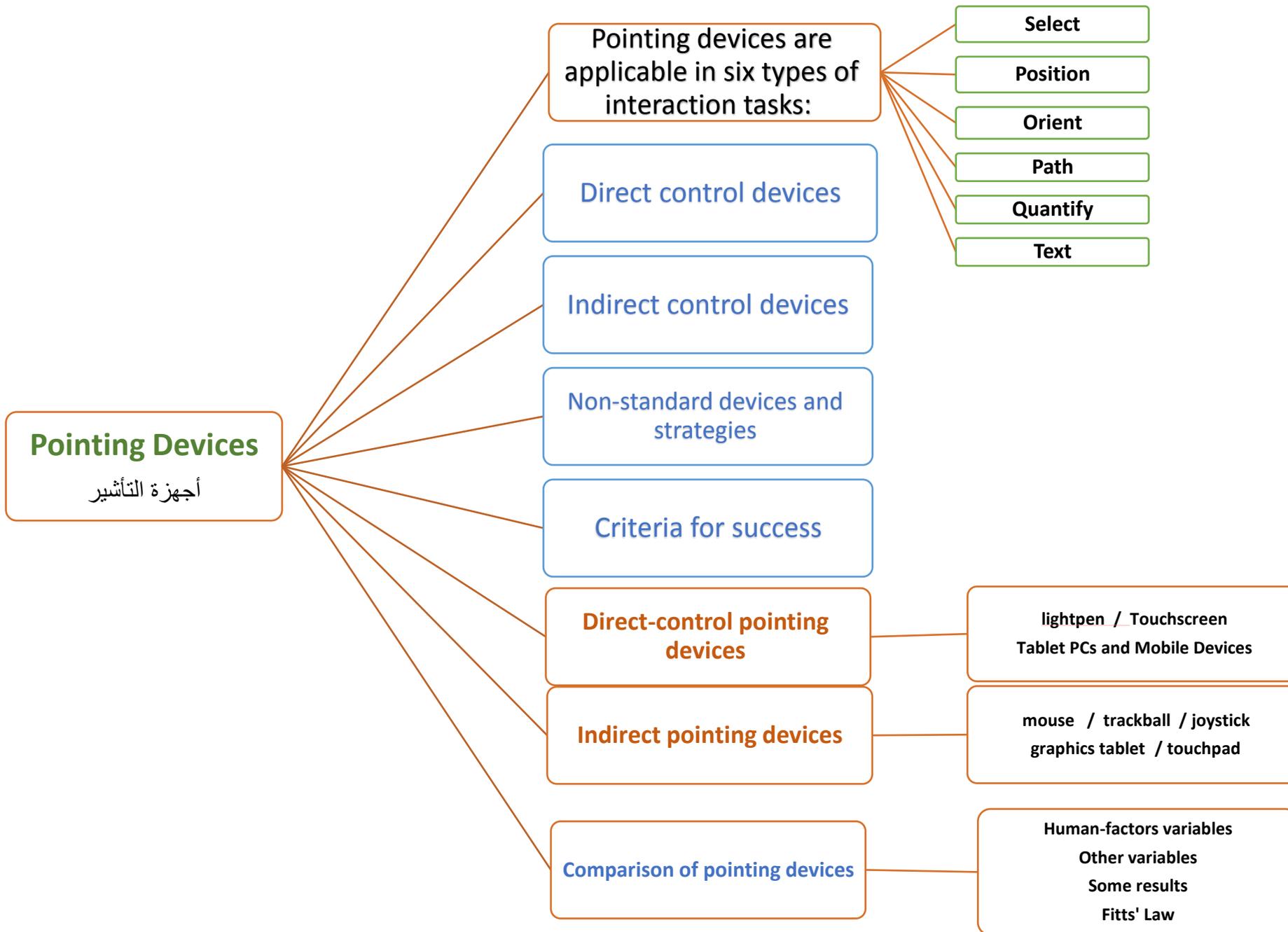
**Mobile
device
displays**

عروض جهاز
النقال

**Animation,
image, and
video**

الرسوم المتحركة
والصور والفيديو





Novel devices
الاجهزه الجديدة

- Foot controls
- Eye-tracking
- Multiple-degrees-of-freedom devices
- DataGlove
- Haptic feedback
- Bimanual input
- Ubiquitous computing and tangible user interfaces
- Handheld devices
- Smart pens
- Table top touch screens
- Game controllers

**Speech and auditory
interfaces**

واجهات النطق والسمع

Speech recognition still does not match the fantasy of
science fiction

Opportunities

Technologies

Obstacles to speech recognition

Obstacles to speech output

Discrete word recognition

Continuous-speech recognition

Speech store and forward

Voice information systems

Speech generation

Audio tones, audiolization, and music

Usage characteristics distinguish displays

Portability - Privacy - Saliency - Ubiquity - Simultaneity

Monochrome displays

are adequate, and are attractive because of their lower cost

RGB shadow-mask displays

small dots of red, green, and blue phosphors packed closely

Raster-scan cathode-ray tube (CRT)

electron beam sweeping out lines of dots to form letters - refresh rates 30 to 70 per second

Liquid-crystal displays (LCDs)

voltage changes influence the polarization of tiny capsules of liquid crystals - flicker-free
size of the capsules limits the resolution

Plasma panel

rows of horizontal wires are slightly separated from vertical wires by small glass-enclosed capsules of neon-based gases

Light-emitting diodes (LEDs)

certain diodes emit light when a voltage is applied
arrays of these small diodes can be assembled to display characters

Electronic ink

Paper like resolution - Tiny capsules with negatively and positively charged particles

Braille displays

Pins provide output for the blind

Large displays

Informational wall displays - Interactive wall displays - Multiple desktop displays

Heads-up and helmet mounted displays

A heads-up display can, for instance, project information on a partially silvered widescreen of an airplane or car
A helmet/head mounted display (HMD) moves the image with the user - 3D images

The display has many important features (8)

Display technology

Displays

Small and Large

العروض الكبيرة والصغيرة

Mobile device displays

عروض جهاز النقل

Currently mobile devices used for brief tasks, except for game playing

Optimize for repetitive tasks

Custom designs to take advantage of every pixel

DataLens allows compact overviews

Web browsing difficult

Okay for linear reading, but making comparisons can be difficult

Animation, image, and video

الرسوم المتحركة والصور والفيديو

Accelerated graphics hardware

More information shared and downloaded on the web

Scanning of images and OCR

Digital video

CD-ROMs and DVDs

Compression and decompression through MPEG

Computer-based video conferencing