CLEMSON
College of ENGINEERING, COMPUTING AND APPLIED SCIENCES

Interfaces 2

9/4/18

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6. Web

Early websites were largely text-based, providing hyperlinks

Concern was with how best to structure information to enable users to navigate and access it easily and quickly

Nowadays, more emphasis on making pages distinctive, striking, and pleasurable

Need to think of how to design information for multi-platforms - keyboard or touch?

- e.g. smartphones, tablets, PCs

Usability versus attractive?

Vanilla or multi-flavor design?

- Ease of finding something versus aesthetic and enjoyable experience

Web designers are:

- “thinking great literature”

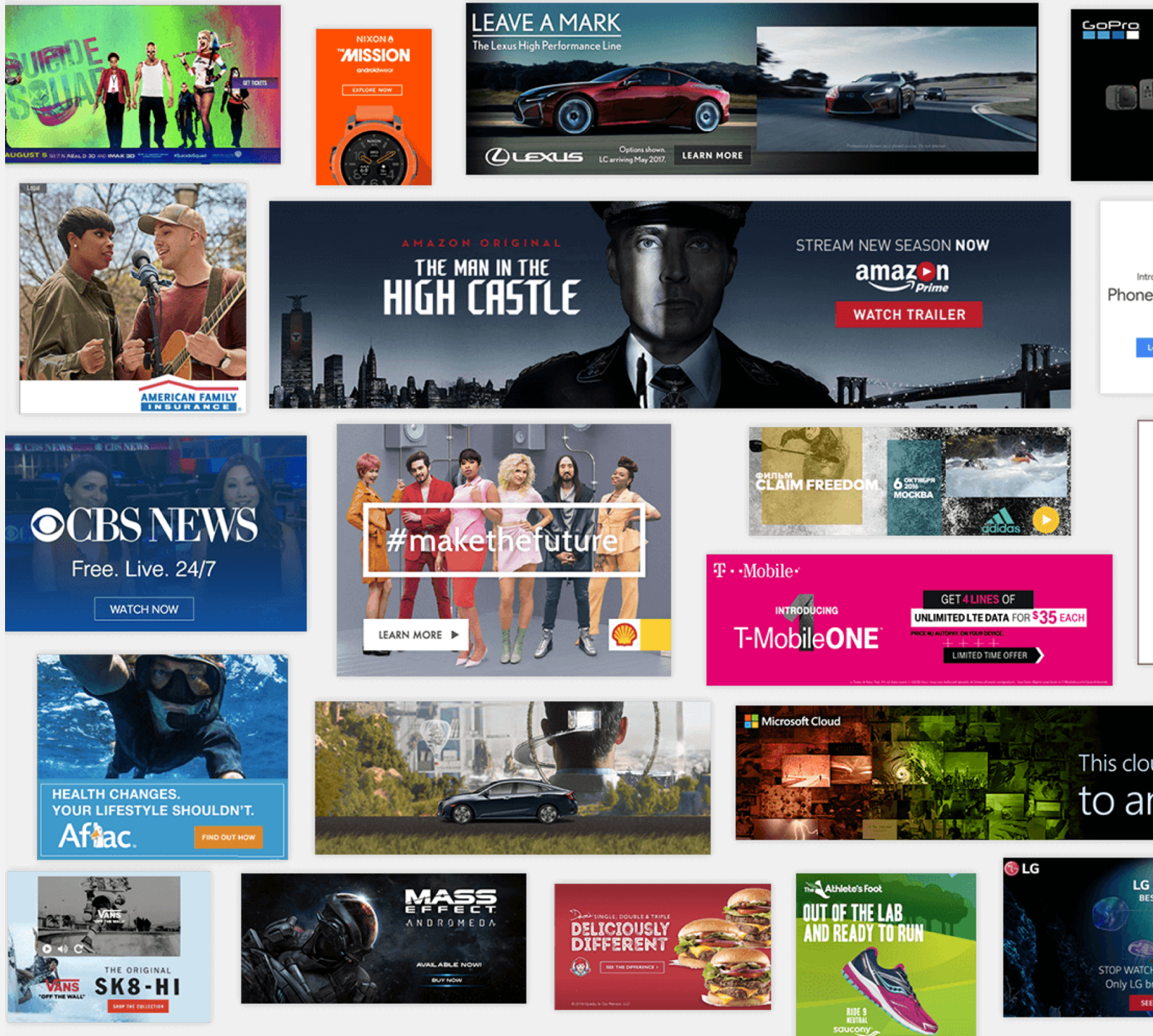
Users read the web like a:

- “billboard going by at 60 miles an hour” (Krug, 2000)

Need to determine how to brand a web page to catch and keep ‘eyeballs’

In your face ads

- Web advertising is often intrusive and pervasive
- Flashing, aggressive, persistent, annoying
- Often need to be ‘actioned’ to get rid of
- What is the alternative?



Research and design issues

Need to consider how best to design, present, and structure information and system behavior

But also content and navigation are central

Veen's (2001) design principles

(1)Where am I?

(2)Where can I go?

(3) What's here?

Activity

Look at the Nike.com website

What kind of website is it?

How does it relate to the design principles outlined by Veen?

Does it matter?

What kind of user experience is it providing for?

What was your experience of engaging with it?

7. Consumer electronics and appliances

Everyday devices in home, public place, or car

- e.g. washing machines, remotes, photocopiers, printers and navigation systems)

And personal devices

- e.g. MP3 player, digital clock and digital camera

Used for short periods

- e.g. putting the washing on, watching a program, buying a ticket, changing the time, taking a snapshot

Need to be usable with minimal, if any, learning

A toaster

ypical toaster with basic physic

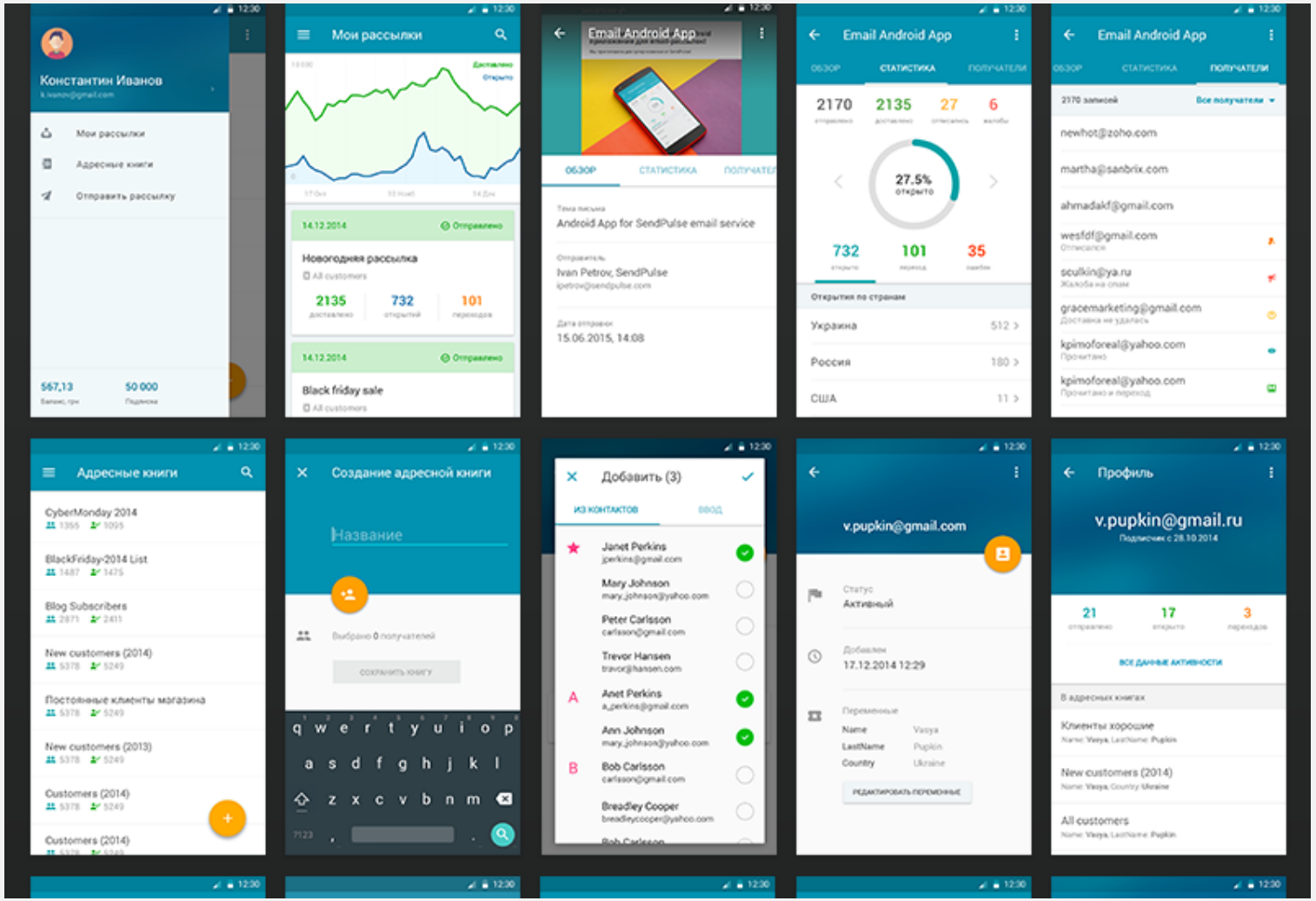
8. Mobile

- Handheld devices intended to be used while on the move

- Have become pervasive, increasingly used in all aspects of everyday and working life

- Apps running on mobiles have greatly expanded, e.g.

  - used in restaurants to take orders
  - car rentals to check in car returns
  - supermarkets for checking stock
  - in the streets for multi-user gaming
  - in education to support life-long learning



Mobile challenges

Smaller screens, small number of physical keys and restricted number of controls

Usability and preference varies

- depends on the dexterity and commitment of the user

Smartphones overcome mobile physical constraints through using multi-touch displays

Research and design issues

Mobile interfaces can be tricky and cumbersome to use for those with poor manual dexterity or ‘fat’ fingers

Key concern is hit area

- area on the phone display that the user touches to make something happen, such as a key, an icon, a button or an app
- space needs to be big enough for fat fingers to accurately press
- if too small the user may accidentally press the wrong key

Activity

Go to a website on both a desktop and mobile device (example espn.com)

- Compare and contrast each
  - What is different/similar?
  - What are the limitations of each?
  - Which do you prefer and why?

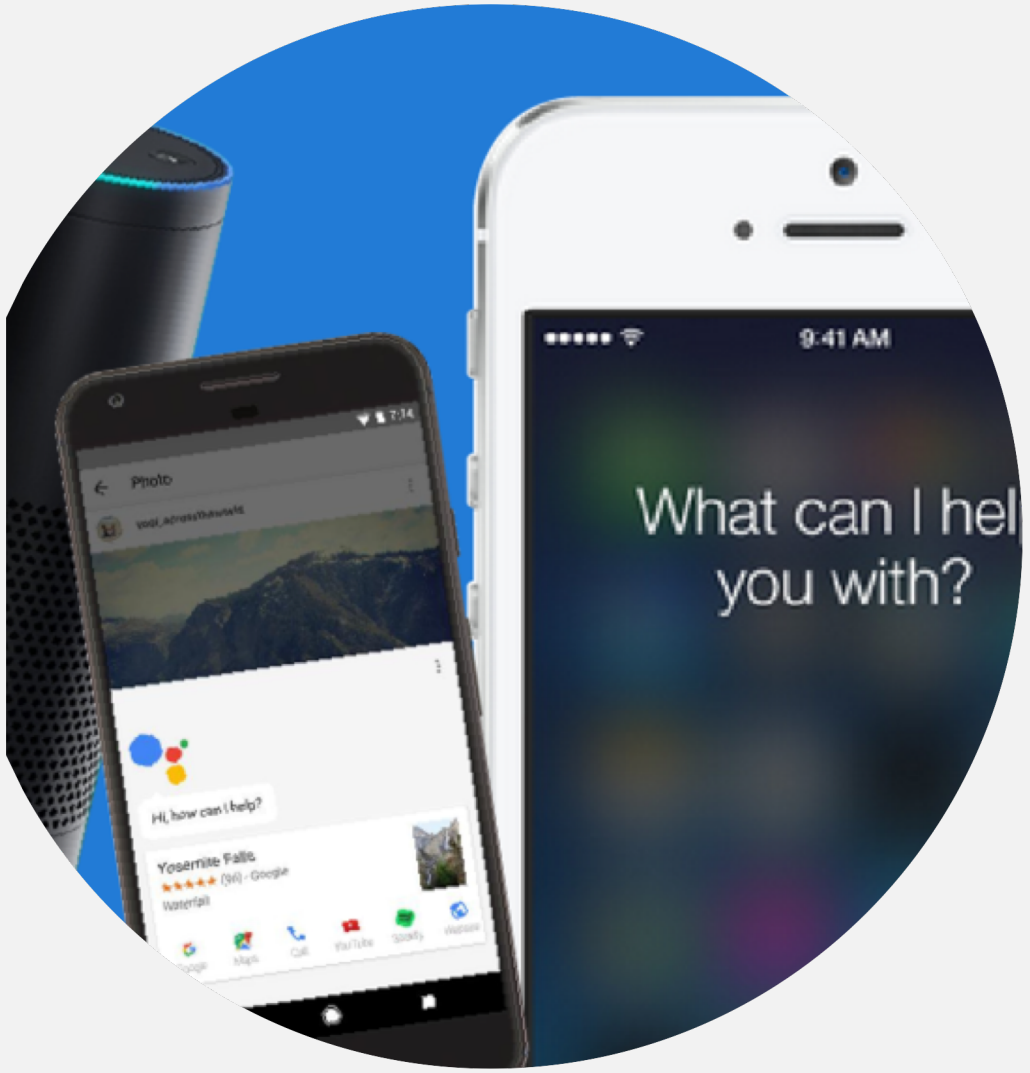
9. Speech

Where a person talks with a system that has a spoken language application, e.g. timetable, travel planner

Used most for inquiring about very specific information, e.g. flight times or to perform a transaction, e.g. buy a ticket

Also used by people with disabilities

- e.g. speech recognition word processors, page scanners, web readers, home control systems



Research and design issues

How to design systems that can keep conversation on track

- help people navigate efficiently through a menu system
- enable them to easily recover from errors
- guide those who are vague or ambiguous in their requests for information or services

Type of voice actor (e.g. male, female, neutral, or dialect)

- do people prefer to listen to and are more patient with a female or male voice, a northern or southern accent?

11. Touch

Touch screens, such as walk-up kiosks, detect the presence and location of a person's touch on the display

Multi-touch support a range of more dynamic finger tip actions, e.g. swiping, flicking, pinching, pushing and tapping

Now used for many kinds of displays, such as Smartphones, iPods, tablets and tabletops

Research and design issues

More fluid and direct styles of interaction involving freehand and pen-based gestures

Core design concerns include whether size, orientation, and shape of touch displays effect collaboration

- Much faster to scroll through wheels, carousels and bars of thumbnail images or lists of options by finger flicking
- More cumbersome, error-prone and slower to type using a virtual keyboard on a touch display than using a physical keyboard

Research and design issues

Will finger-flicking, swiping, stroking and touching a screen result in new ways of consuming, reading, creating and searching digital content?

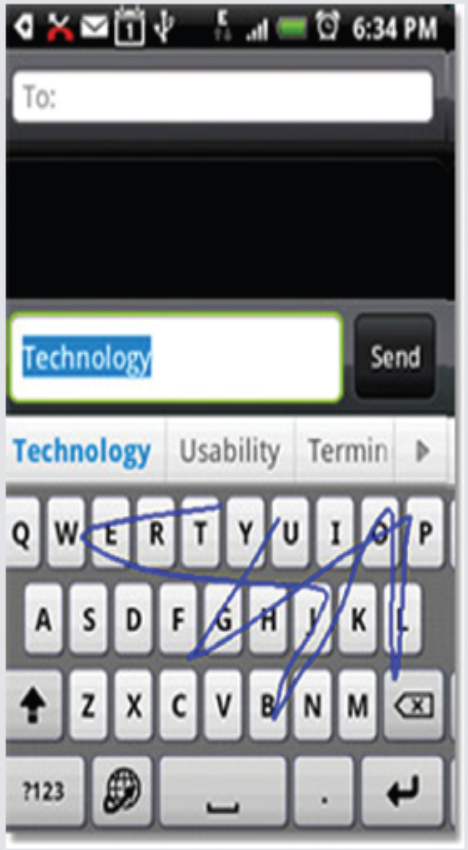


Figure 6.23 The Swype interface developed for mobile touch displays

Source: Reproduced from http://www.geek.com/articles/mobile/nuances-t9-trace-virtual-keyboard-allows-you-to-swipe-rather-than-type-20100323/technology/.

13. Haptic

Tactile feedback

- applying vibration and forces to a person’s body, using actuators that are embedded in their clothing or a device they are carrying, such as a smartphone

Can enrich user experience or nudge them to correct error

Can also be used to simulate the sense of touch between remote people who want to communicate

14. Multi-modal

Meant to provide enriched and complex user experiences

- multiplying how information is experienced and detected using different modalities, i.e. touch, sight, sound, speech
- support more flexible, efficient, and expressive means of human–computer interaction
- Most common is speech and vision

Research and design issues

Need to recognize and analyse speech, gesture, and eye gaze

What is gained from combining different input and outputs

Is talking and gesturing, as humans do with other humans, a natural way of interacting with a computer?

15. Shareable/ Collaborative

Shareable interfaces are designed for more than one person to use

- provide multiple inputs and sometimes allow simultaneous input by co-located groups
- large wall displays where people use their own pens or gestures
- interactive tabletops where small groups interact with information using their fingertips
- e.g. DiamondTouch, Smart Table and Surface

A smartboard

(a)

Figure 6.27 (a) A SmartBoard in use during a meeting and (b) Mitsubishi's interactive tabletop interface, where collocated users can interact simultaneously with digital content using their fingertips

Source: (a) ©2006 SMART Technologies Inc. Used with permission. (b) Image courtesy of Mitsubishi Electric Research Labs.

DiamondTouch Tabletop

(b)

Figure 6.27 (a) A SmartBoard in use during a meeting and (b) Mitsubishi's interactive tabletop interface, where collocated users can interact simultaneously with digital content using their fingertips

Source: (a) ©2006 SMART Technologies Inc. Used with permission. (b) Image courtesy of Mitsubishi Electric Research Labs.

Advantages

Provide a large interactional space that can support flexible group working

Can be used by multiple users

- Can point to and touch information being displayed
- Simultaneously view the interactions and have same shared point of reference as others

Can support more equitable participation compared with groups using single PC

Research and design issues

More fluid and direct styles of interaction involving freehand and pen-based gestures

Core design concerns include whether size, orientation, and shape of the display have an effect on collaboration

Horizontal surfaces compared with vertical ones support more turn-taking and collaborative working in co-located groups

Providing larger-sized tabletops does not improve group working but encourages more division of labor

16. Tangible

Type of sensor-based interaction, where physical objects, e.g., bricks, are coupled with digital representations

When a person manipulates the physical object/s it causes a digital effect to occur, e.g. an animation

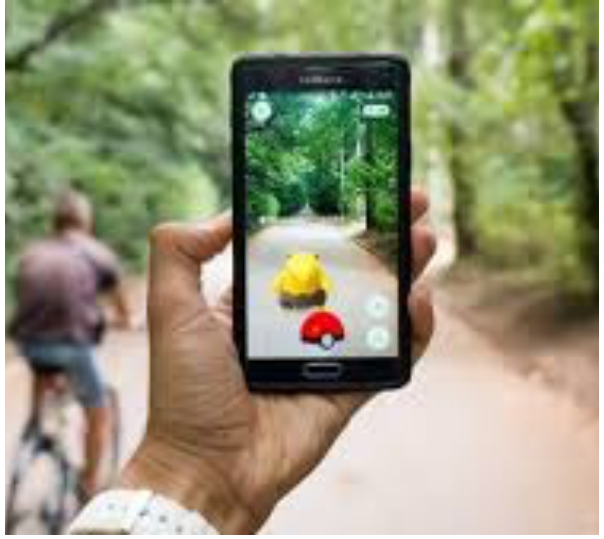
Digital effects can take place in a number of media and places or can be embedded in the physical object

17. Augmented and mixed reality

Augmented reality - virtual representations are superimposed on physical devices and objects

Mixed reality - views of the real world are combined with views of a virtual environment

Many applications including medicine, games, flying, and everyday exploring



Examples

Research and design issues

What kind of digital augmentation?

- When and where in physical environment?
- Needs to stand out but not distract from ongoing task
- Need to be able to align with real world objects

What kind of device?

- Smartphone, head up display or other?

18.Wearables

First developments were head- and eyewear-mounted cameras that enabled user to record what was seen and to access digital information

Since, jewellery, head-mounted caps, smart fabrics, glasses, shoes, and jackets have all been used

- provide the user with a means of interacting with digital information while on the move

Applications include automatic diaries, tour guides, cycle indicators and fashion clothing

Google Glass: short-lived

Figure 6.32 Google Glass

Source: https://www.google.co.uk/intl/en/glass/start/.
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What were the pros and cons?

Research and design issues

Comfort

- needs to be light, small, not get in the way, fashionable, and preferably hidden in the clothing

Hygiene

- is it possible to wash or clean the clothing once worn?

Ease of wear

- how easy is it to remove the electronic gadgetry and replace it?

Usability

- how does the user control the devices that are embedded in the clothing?

20. Brain-computer interfaces

Brain–computer interfaces (BCI) provide a communication pathway between a person's brain waves and an external device, such as a cursor on a screen

Person is trained to concentrate on the task, e.g. moving the cursor

BCIs work through detecting changes in the neural functioning in the brain

BCIs apps:

- Games
- enable people who are paralysed to control robots

Brainball game

Figure 6.35 The Brainball game using a brain–computer interface

Source: "Brainball" from The Interactive Institute. Reproduced with permission.

Which interface?

Will depend on task, users, context, cost, robustness, etc.

Mobile platforms taking over from PCs

Speech interfaces also being used much more for a variety of commercial services

Appliance and vehicle interfaces becoming more important

Shareable and tangible interfaces entering our homes, schools, public places, and workplaces

Reading for next class...

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