Human Computer Interaction

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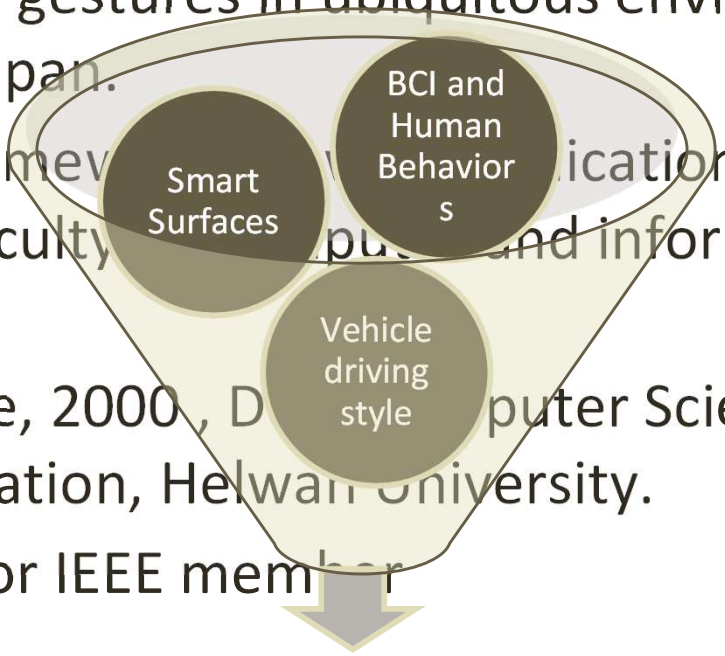
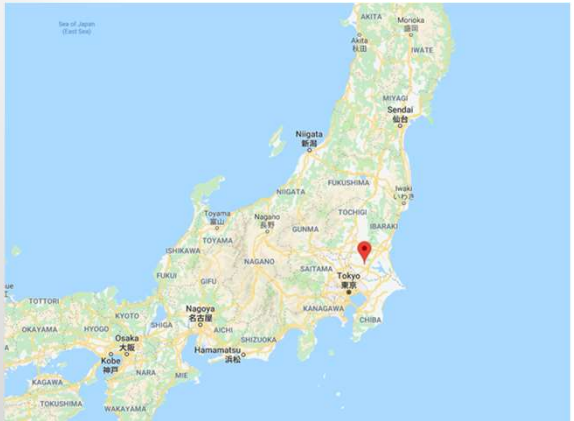
Biography

- Phd, “Interaction with gestures in ubiquitous environments” ,2011, Tsukuba University, Japan.
- Msc.,”Building OO Framev ications”, 2004, Dep. Computer Sceince, Faculty puts and information, Helwan University.
- Bsc. Computer Science, 2000 , D puter Science, Faculty of Computer and information, Helwan University.
- ACM SIGCHI and Senior IEEE mem r



Human Computer Interaction



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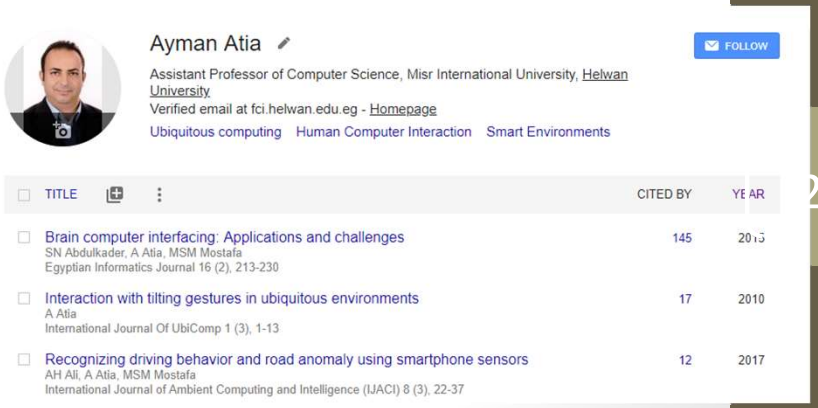


Topics

- Overview of ID / HCI
- PACT Framework for Designing Interactive Systems
- Human Cognition
- Interaction Devices and Interaction Types
- Design Principles and the overall Design Process
- Conceptual and Physical Design
- Interaction paradigms
- Evaluating Interactive Systems

Why Usability is Important

UI

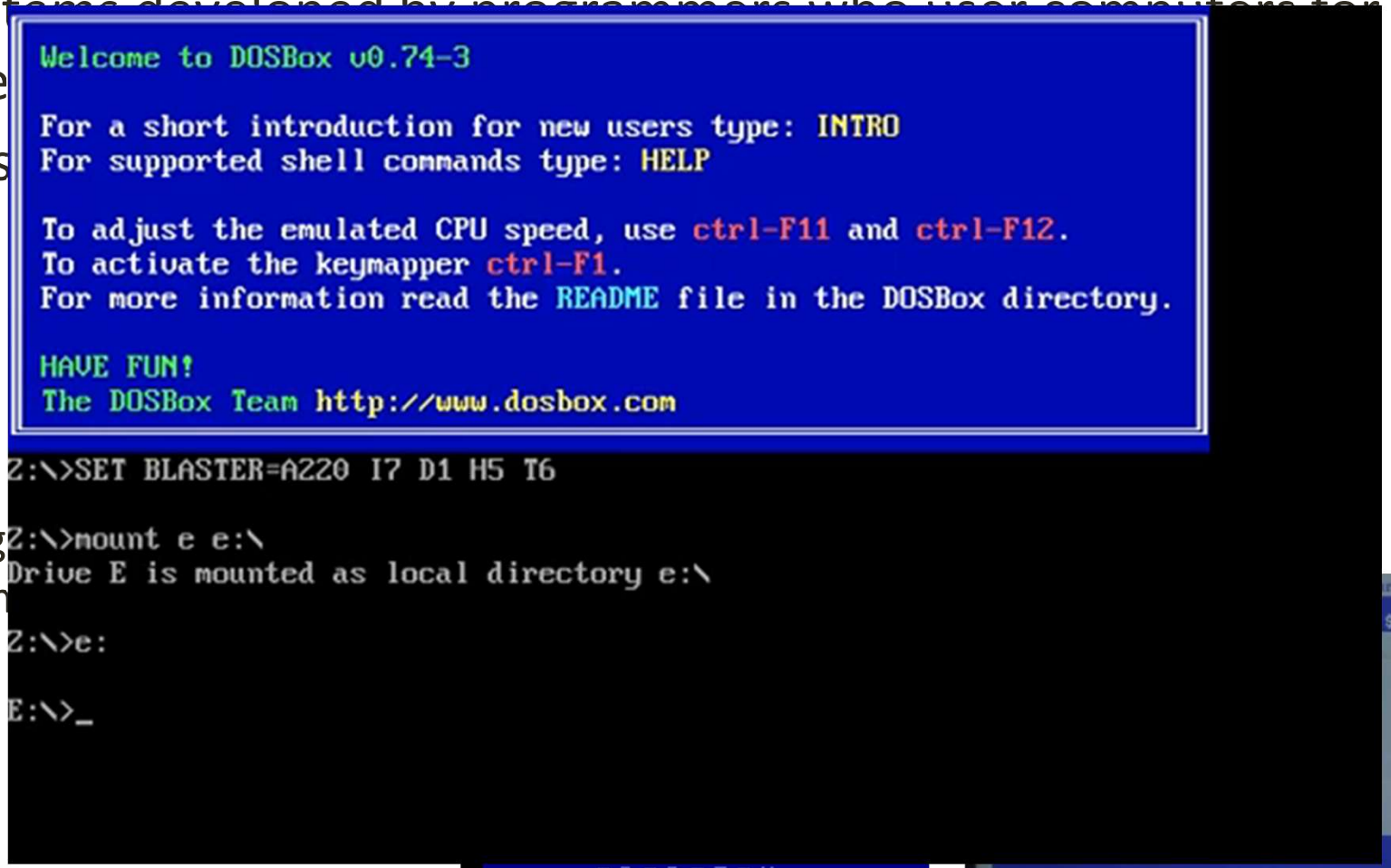
UX

Interactive Designers

- Their goal is to design interactive systems that are enjoyable to use, that do useful things and that enhance the lives of the people that use them.
- They want their interactive systems to be accessible, usable and engaging.
- In order to achieve this they believe that the design of such systems should be human-centred.
- That is, designers need to put people rather than technology at the center of their design process.

Past PC

- Not considering users who used the PC
- Systems developed by programmers who used computers for
  eve
- Des



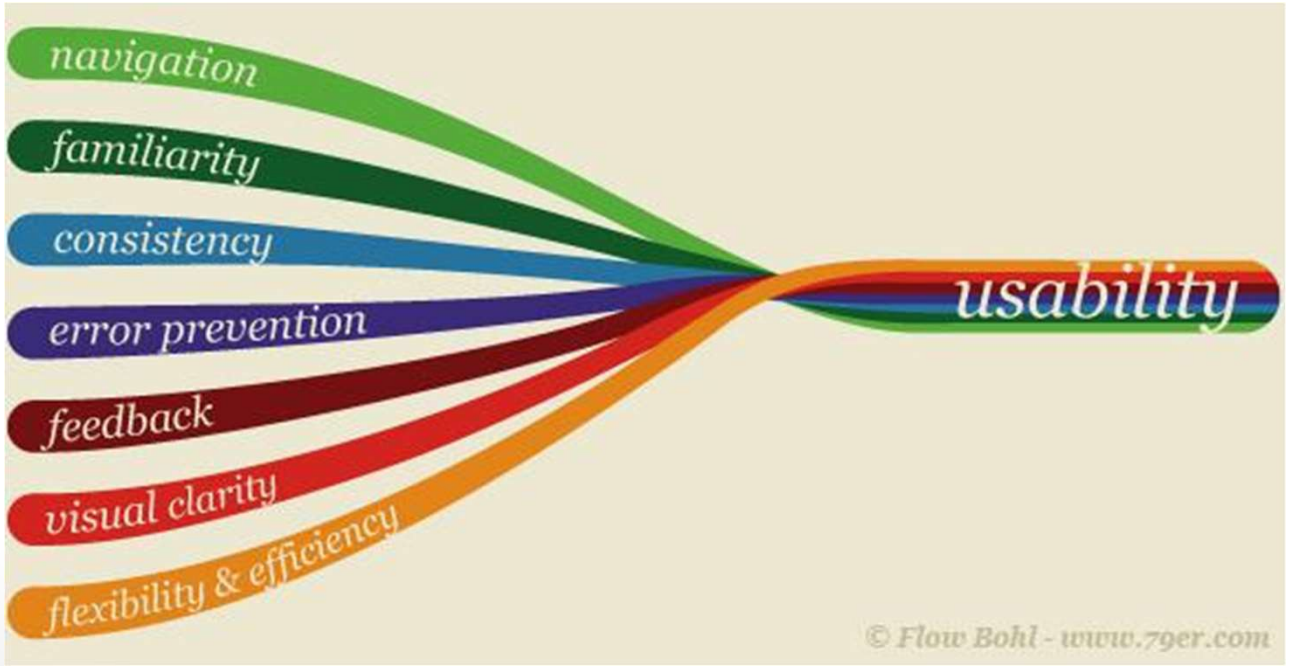
Forgetting
have not h

Now PC

- Web and mobile dramatically changed the age of HCI
  - E-commerce
  - E-Guiding
  - E-Learning
  - E……
- Before the immediacy of e-commerce, usability problems were only discovered after purchase.
- If you bought a nice looking MP3 player and brought it home only to find it was difficult to use, you could not take it back!
- The shop would say that it delivers its functions, all you had to do was to learn how to operate it properly. (read the manual)

Web usability

- Customers look to usability
- If the system is hard to use, or if they do not understand it, they will go somewhere else to make their purchase.
- People are learning that systems do not have to be hard to use and are becoming more critical about the design of other products, such as their MP3 players too.



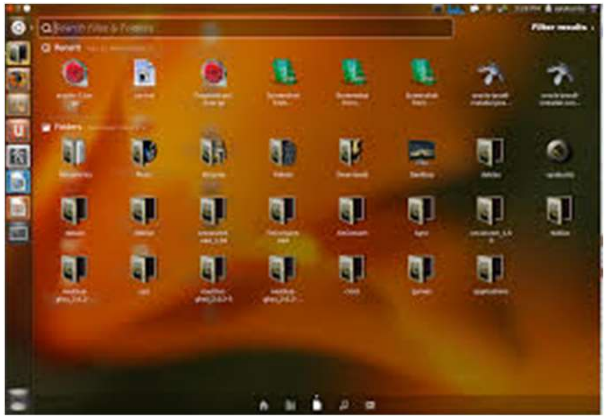
Bad designs http://www.baddesigns.com/

ed version
Kriwaczek

Interactive systems

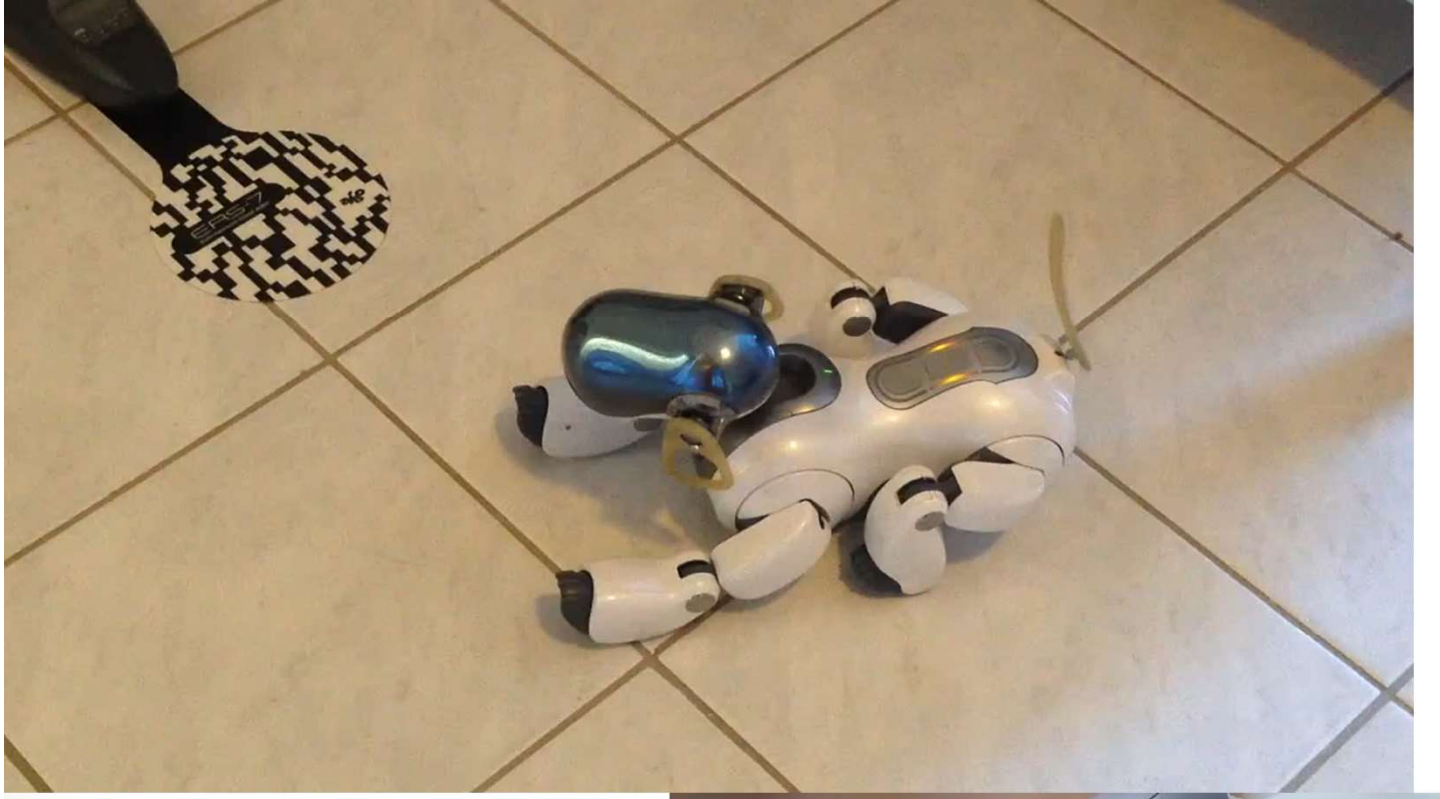
- Mac OS
- The iPod is an information appliance designed and optimized for a limited set of functions.
- The AIBO is a programmable product for fun and Companionship.
- Some interactive systems are concerned with helping people cooperate and create communities.

Mac OS – Ubuntu and Win 10



Modern mp3 players

Sony AIBO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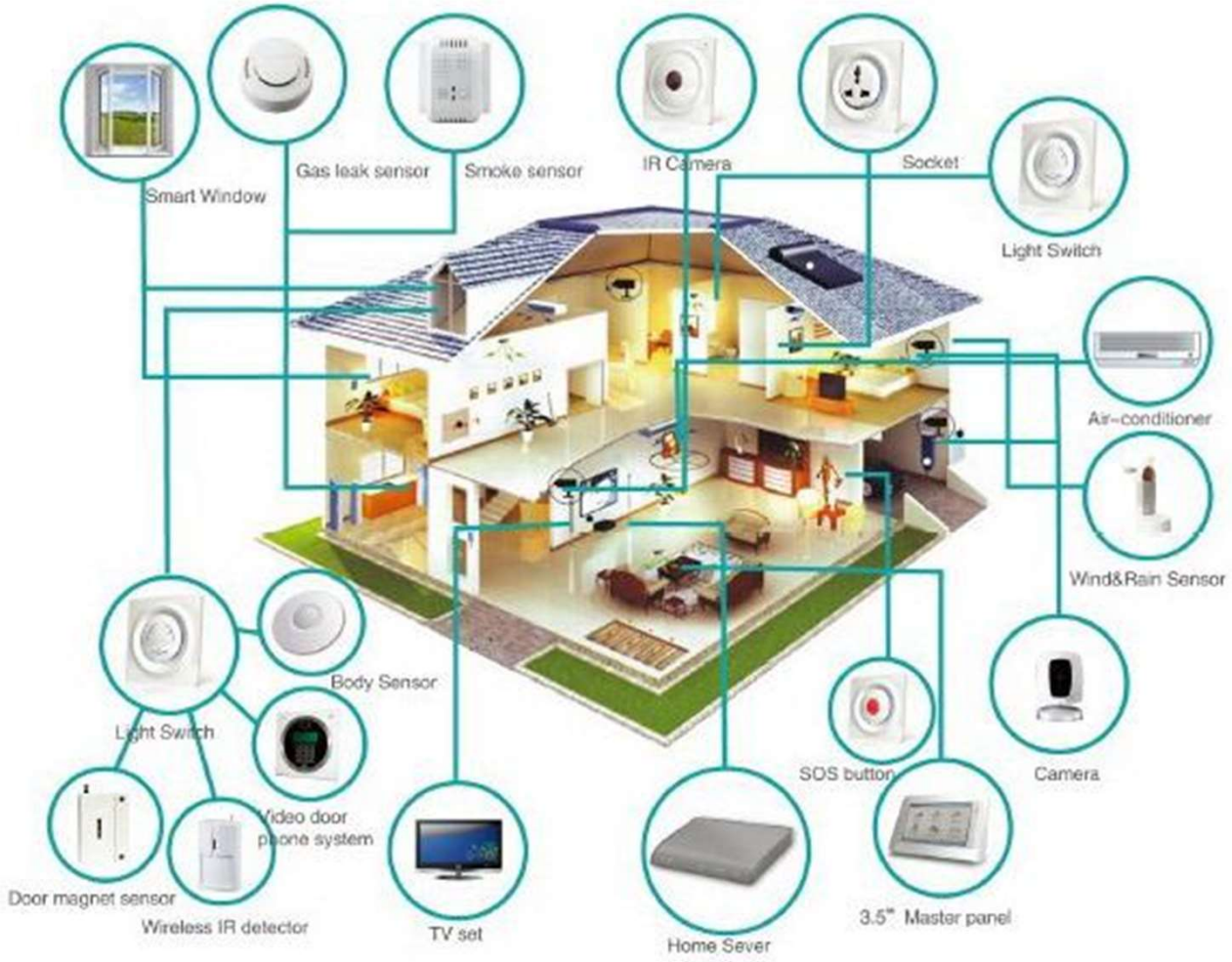
Smart Home


Smart Window
Gas leak sensor
Smoke sensor
IR Camera
Socket
Light Switch
Air-conditioner
Wind&Rain Sensor
Camera
SOS button
3.5" Master panel
Home Sever
TV set
Video door phone system
Body Sensor
Light Switch
Door magnet sensor
Wireless IR detector

Elements of Interactive Systems

- Technologies - what can technology do? What content does something have?
- People - who will use it, who will be affected by it?
- Activities and contexts - what will people have to do in what circumstances?

Design

- The creative process of specifying something new and
- The representations that are produced along the way
- – e.g site map, blueprints, sketches, etc.
- It typically involves much iteration –
- both problem and solution evolve during design
- Our materials are interactive systems… we work within and shape this medium
- – Such as cameras, phones, web sites, DVDs, computer applications… any device or system that is *interactive*

Interactive Systems

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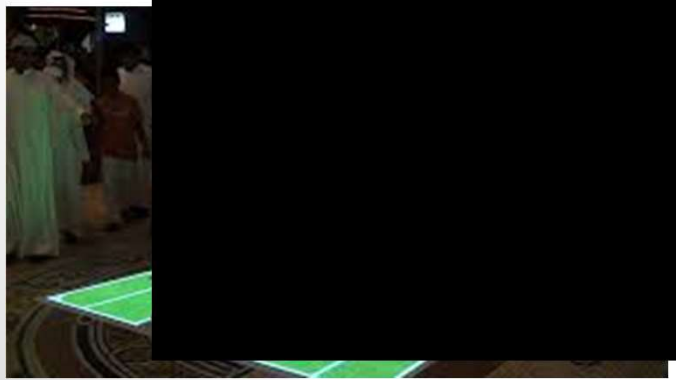


User Interface

- All those parts of the system we come into contact with…
- **Physically** we might interact with a device by pressing buttons or moving levers and the interactive device might respond by providing feedback through the pressure of the button or lever.
- **Perceptually** the device displays things on a screen, or makes noises which we can see and hear.
- **Conceptually** we interact with a device by trying to work out what it does and what we should be doing. The device provides messages and other displays which are designed to help us do this.

Input / Output

- • Input
  - – some methods are needed to enter commands (tell the
  - system what we want it to do)
  - – We also need to be able to navigate through the
  - commands and the content of the system
  - – We need to enter data or other content into the system
- • Output
  - – So the system can tell us what is happening - provide
  - feedback
  - – So the system can display the content to us.

Designing interactive system

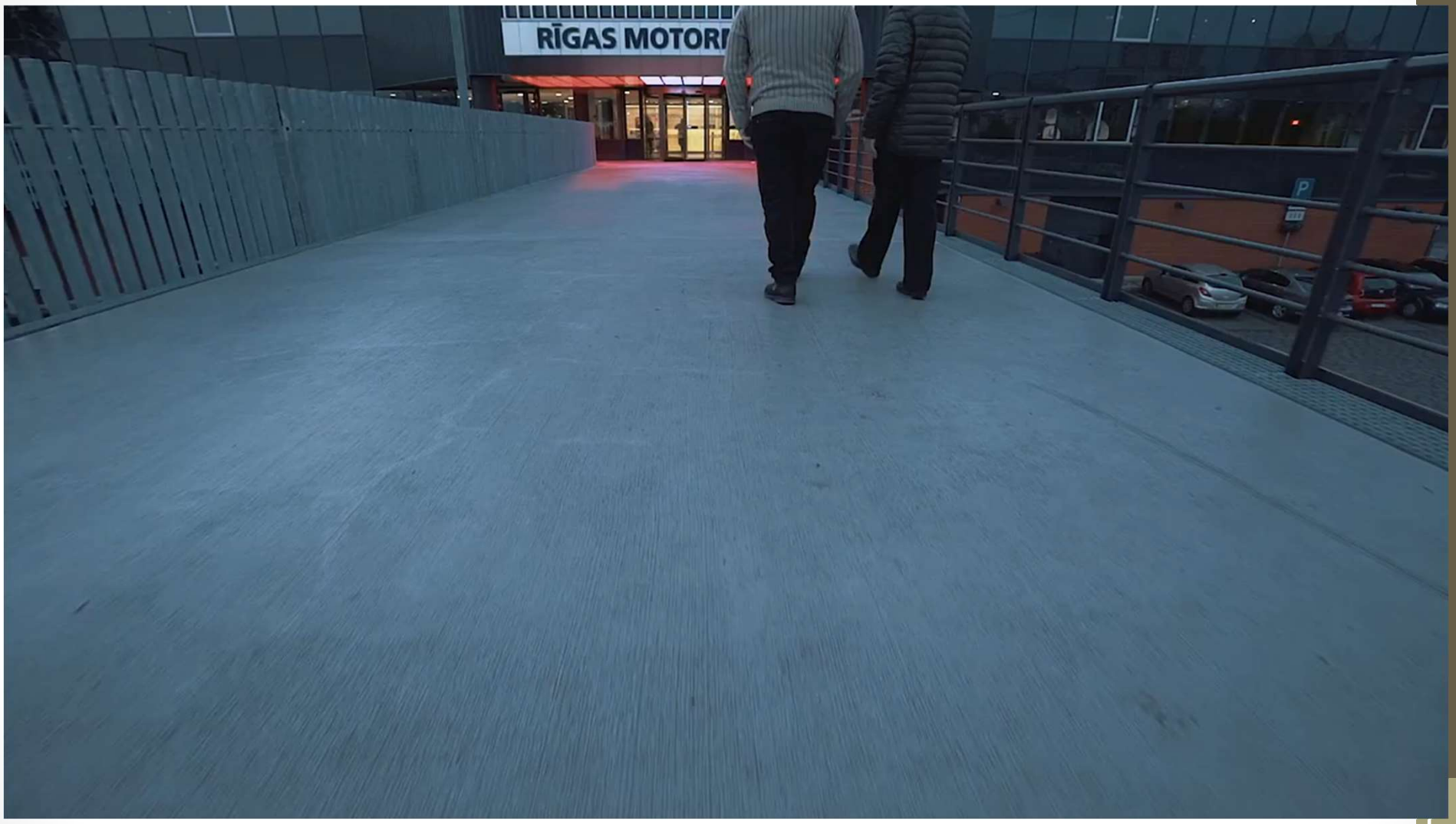
- …. is more than just designing the user interface …. is more than designing the input, output and content
- It is about designing the whole human-computer interaction
- It is about designing the human-human interaction that is often enabled *through* devices
- It is about designing whole environments of interlinked devices and objects
- – Think of designing museum exhibits, or an amusement park
- – Or an airport, a hotel lobby or a shopping mall

Exercise

- Divide into groups of ……..
- Each group select (Museum, Airport, Restaurant)
- Please answer the following questions
  - What is the problem faced for each system
  - What idea can help to solve the problems mentioned
  - What technologies you will use
  - Do you think this parameters will be included
    - Time to do activity
    - Personality of the one using your system
    - Emotions of the person
    - Education level

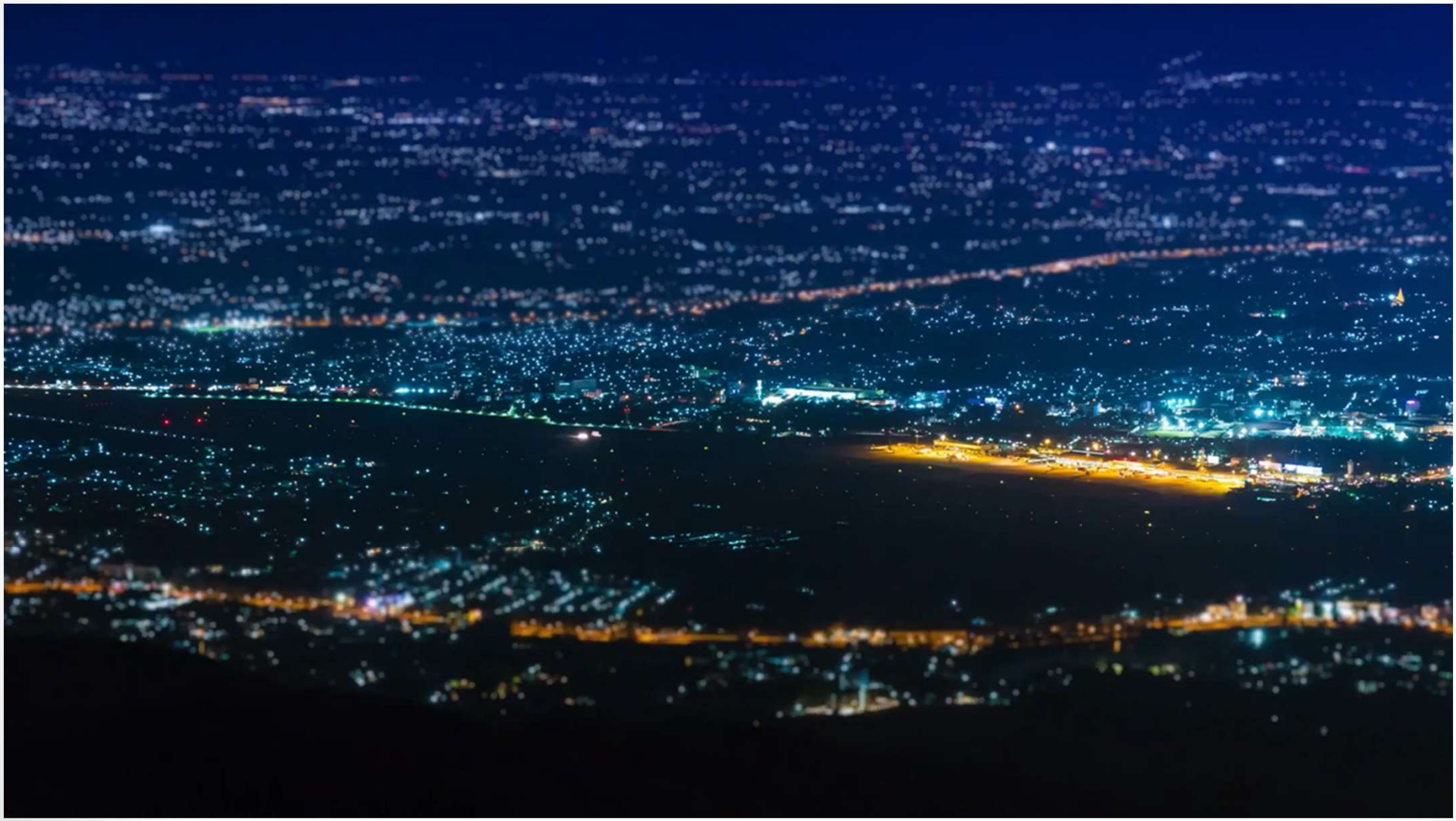
Interactive Museum

Interactive Museum 2



Inamo Restaurant

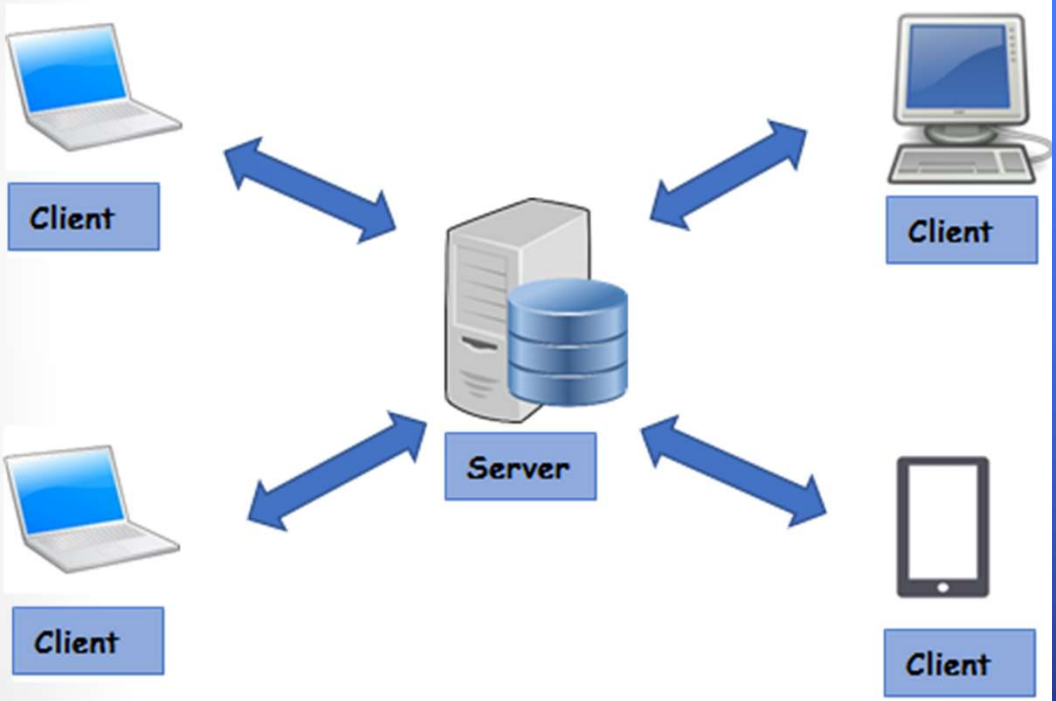
Smart Air-Port



Being Human Centered

- We take a human-centred approach to designing interactive systems. That means…
- thinking about what people want to do rather than just what the technology can do
- designing new ways to connect people with people
- involving people in the design process
- designing for diversity

Moving from computer center arch. To human center arch.



Some History for HCI

- 1950s - computers invented
- 1960s - first screen and mouse developed
- 1970s - business start to take up computers seriously. First internet created
- 1980s - Arrival of microchip and micro-computers
- 1984 - Apple Macintosh (Xerox Star). Games consoles arrive. First conferences on HCI
- 1990s - World Wide Web arrives
- … and so on to Ubiquitous Computing

Mark Weiser 1999

What is Ubiquitous Computing (ubicomp)

- **Ubicomp** is a post-desktop model of human computer interaction in which information processing has been thoroughly integrated into everyday objects and activities.

- Integrate computers seamlessly into the world
  – invisible, everywhere computing.
  – Often called **pervasive/invisible computing.**

- Computers are mostly not invisible , they dominate interaction with them.

- *Ubicomp* is about making computers invisible.

http://cs.calstatela.edu/wiki/images/c/c8/Ubiquitouscomputing.ppt

Ubiquitous computing = mobile computing + intelligent environment.

Technology View

- Computers everywhere – embedded into fridges, washing machines, door locks, cars, furniture.
- Intelligent environment.
- Mobile portable computing devices
- Wireless communication – seamless mobile/fixed.

User View

- Invisible – implicit interaction with your environment.
- Augmenting human abilities in context of tasks

http://cs.calstatela.edu/wiki/images/c/c8/Ubiquitouscomputing.ppt

Early work

Tabs:

- very small – smart badge with user info, calendar, diary, etc.
- allow personalized settings to follow a user
- Carried around by a person
- Hundreds in a room
  - Remote controllers
  - Badges
  - Tags / Labels (RFID)
  - Locating system (tags as library catalogs)
  - Animate static physical objects (active calendar, a

105mm X 73mm X 24mm
215g

http://cs.calstatela.edu/wiki/images/c/c8/Ubiquitouscomputing.ppt

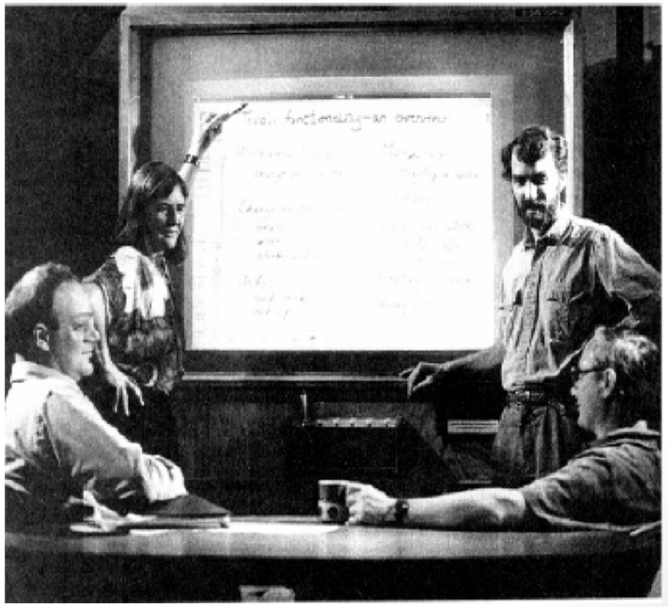
PADs

- Foot-scale Ubicomp devices
  - A sheet of paper / tablet PC.
  - Portable computers but not laptop metaphor
- Tens in a room
  - Like scrap papers that can be grabbed unique ID.

http://cs.calstatela.edu/wiki/images/c/c8/Ubiquitouscomputing.ppt

Boards and large display

- larger display – whiteboard size.
- Personalized electronic bulletin boards.
- Multiple pens.
- Meeting capture.
- Lots of bandwidth available because they're plugged into the wall
- White board with e-chalk
  Shared white board with remote participants.
- Video screen.
- Electronic Bookcases



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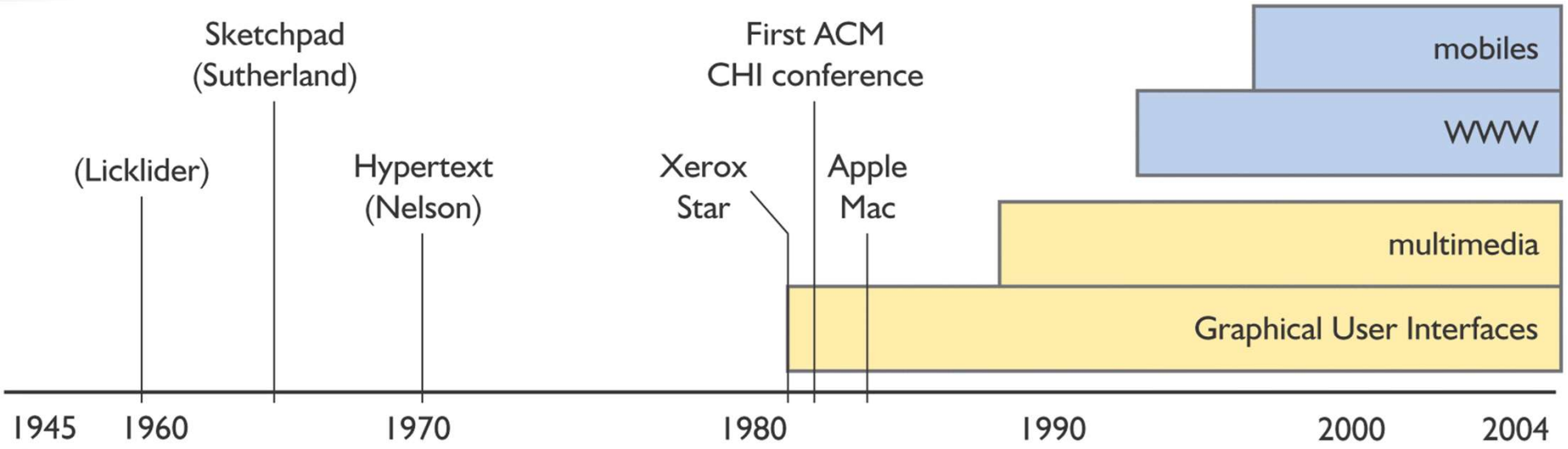
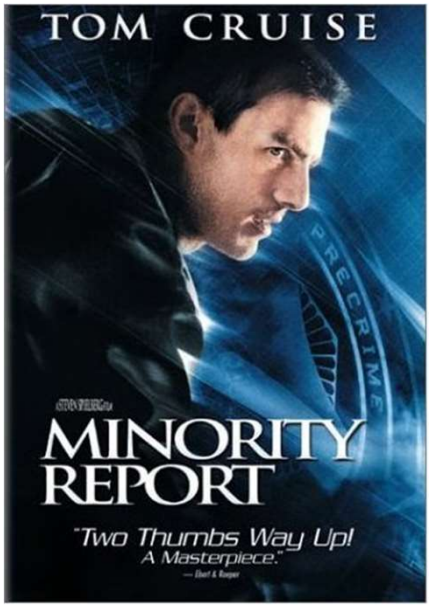
Interactive system time line



Where are we headed 1/2?

- Science and Drama

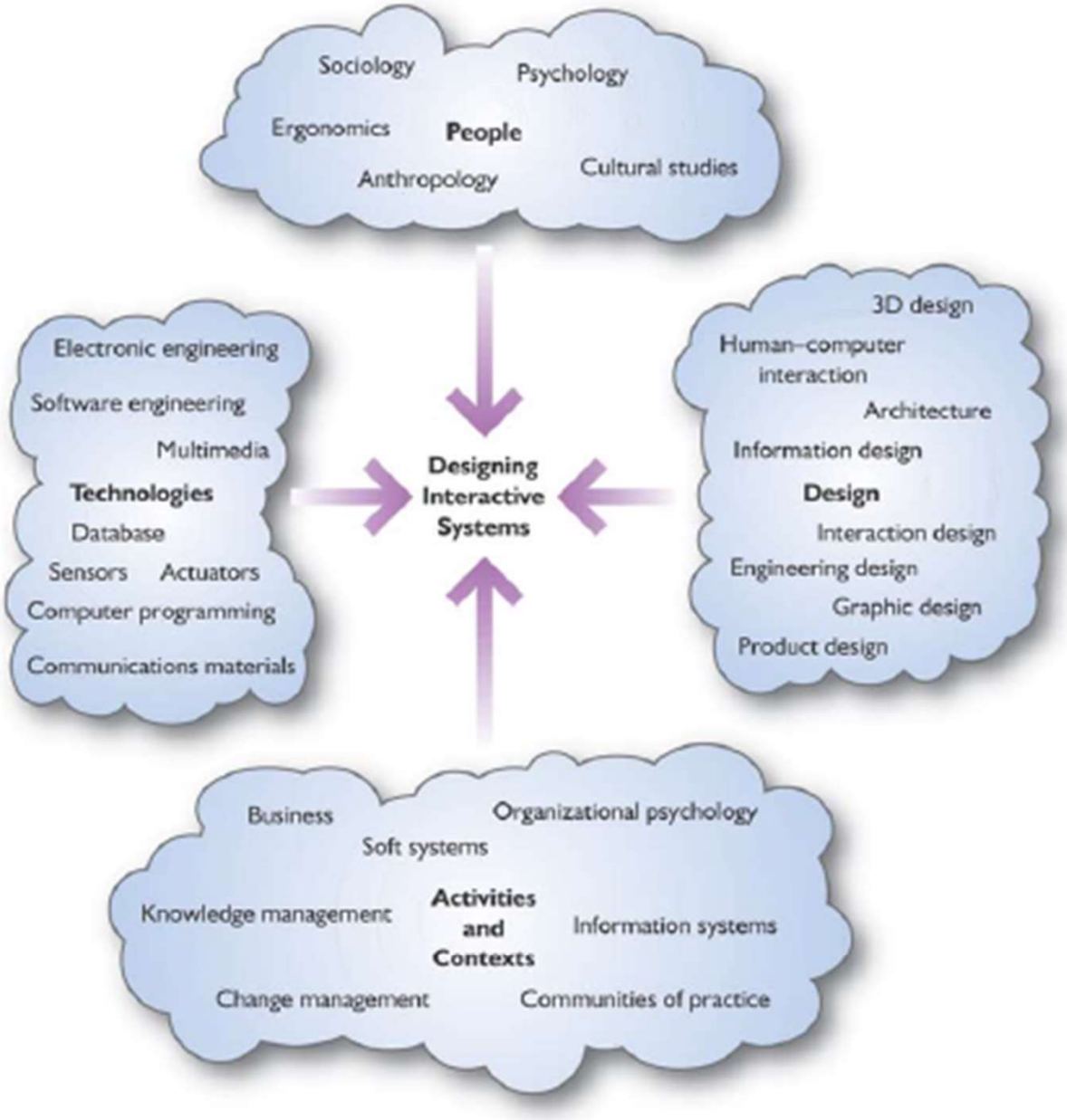


Where are we headed 2/2

- Everyday things requiring everyday skills to use
- With a clear, focused function
- Provide peer-to-peer interaction
- And have a direct user interface - physical interaction
- Support the idea of ‘closure’ - completing a task
- Allow you to do things on impulse
- Are personalizable and portable

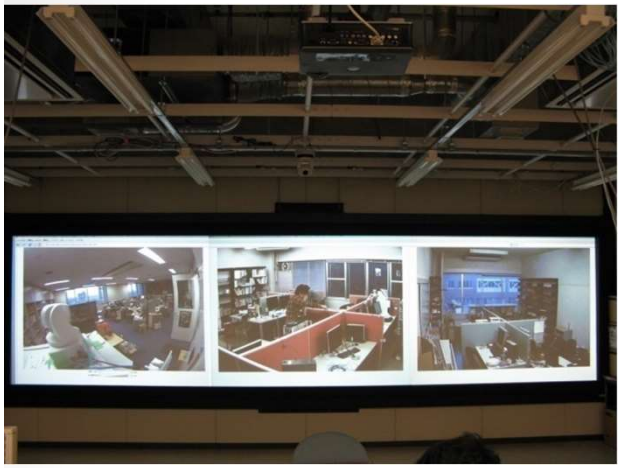
The Skills of the Interactive Systems Designer

- **Knowing about people**
- – Sociology, anthropology, psychology, culture
- **Knowing about technologies**
- – Software, communications, materials, database, etc.
- **Knowing about activities and contexts**
- – Communities of practice, information systems, organizations, knowledge management
- **Knowing about design**
- – Fashion, interior, information design, architecture,
- product design



Disciplines contributing to interactive systems design

Human Computer Interaction

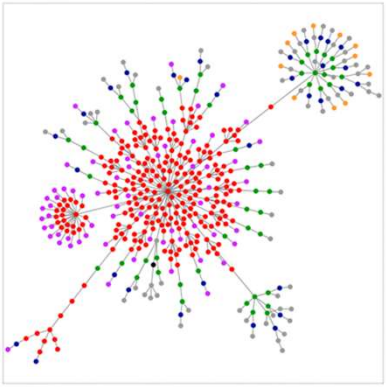


Large display screen

Smart surfaces

Head mounted/small displays

Augmented reality



Visualization

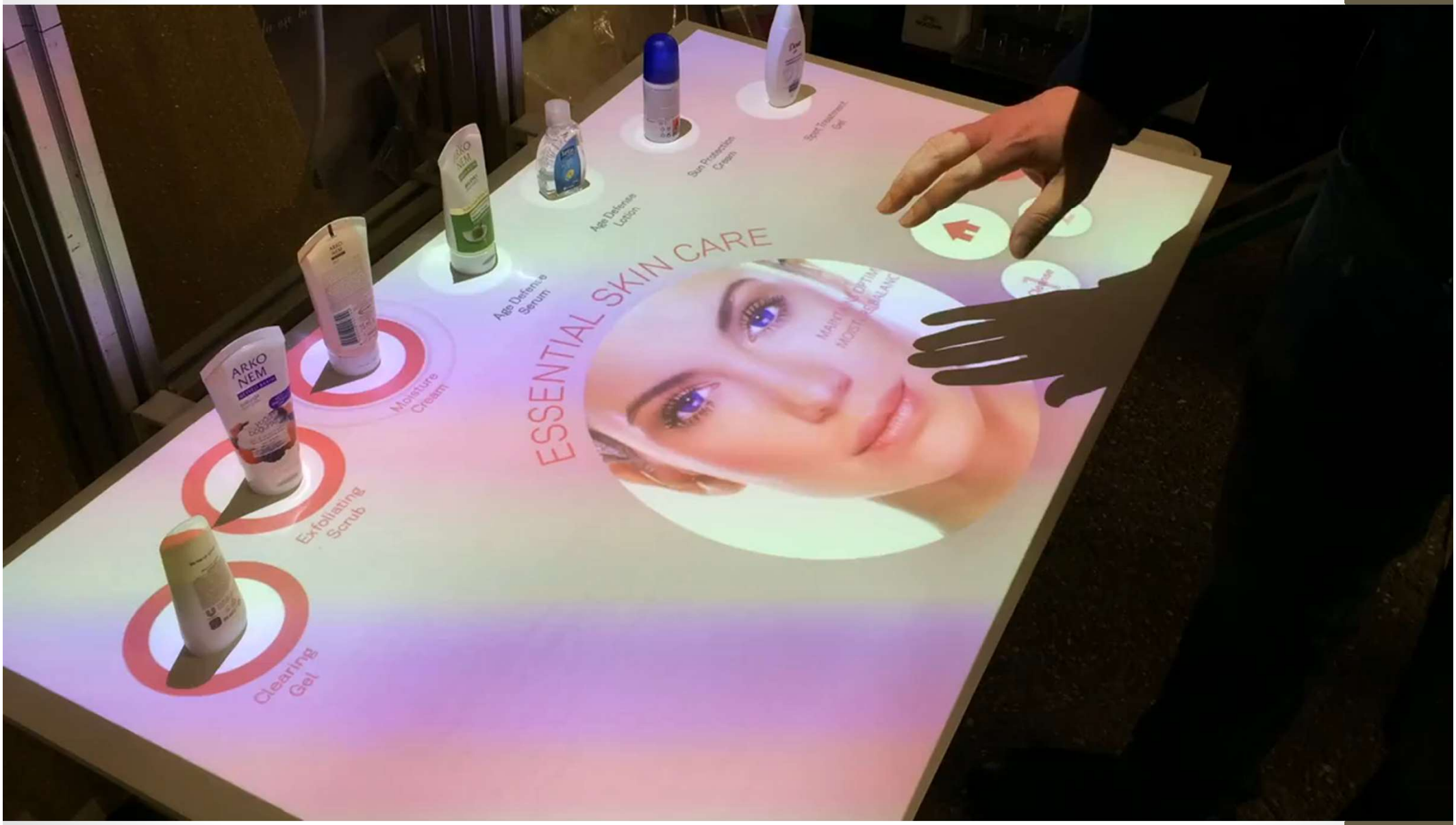
BCI

Intuitive interfaces

TUI

Big display

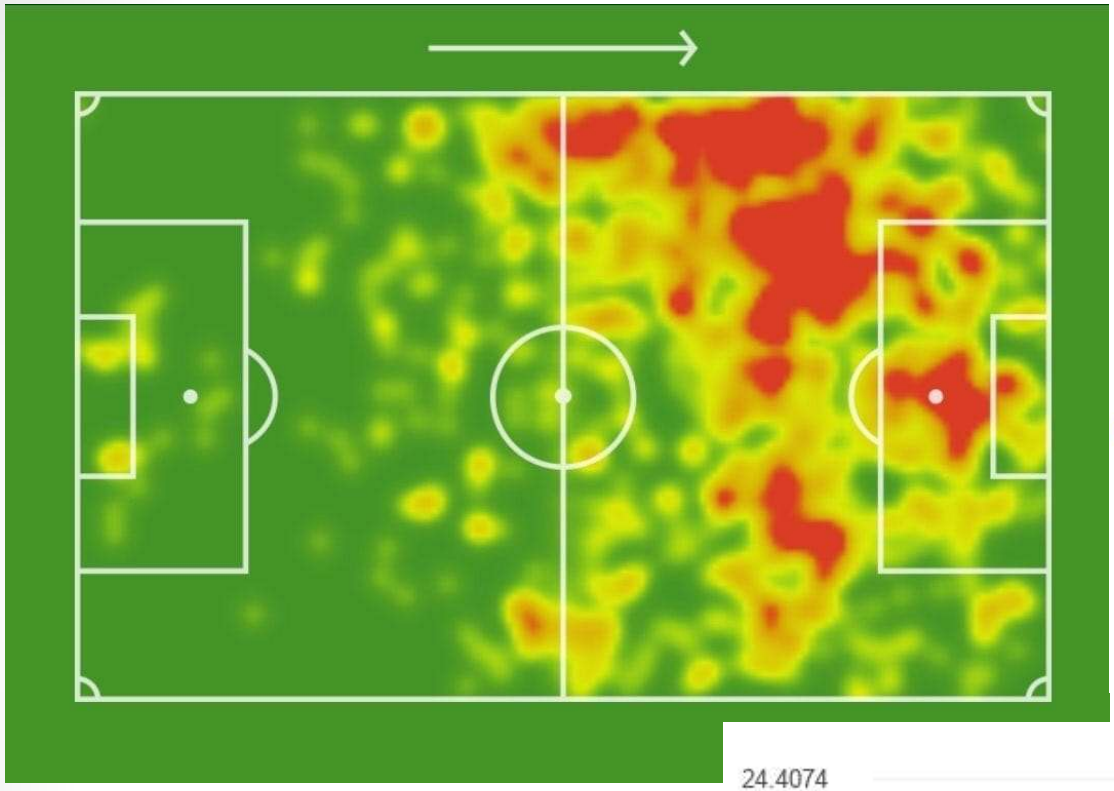
Smart Surfaces

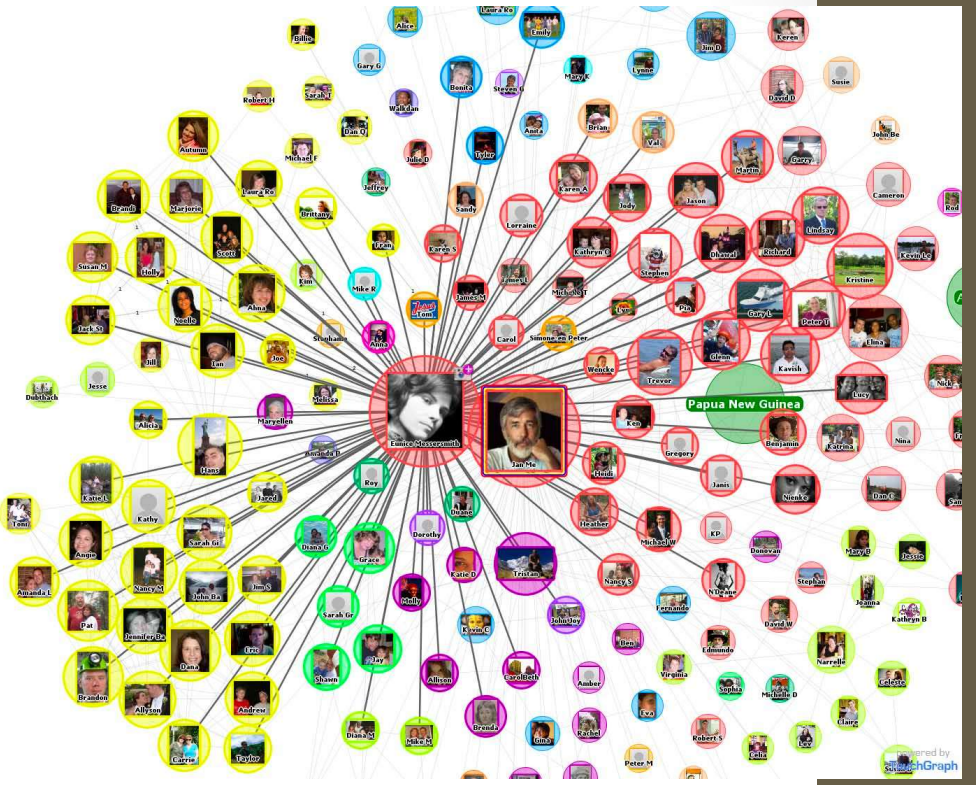


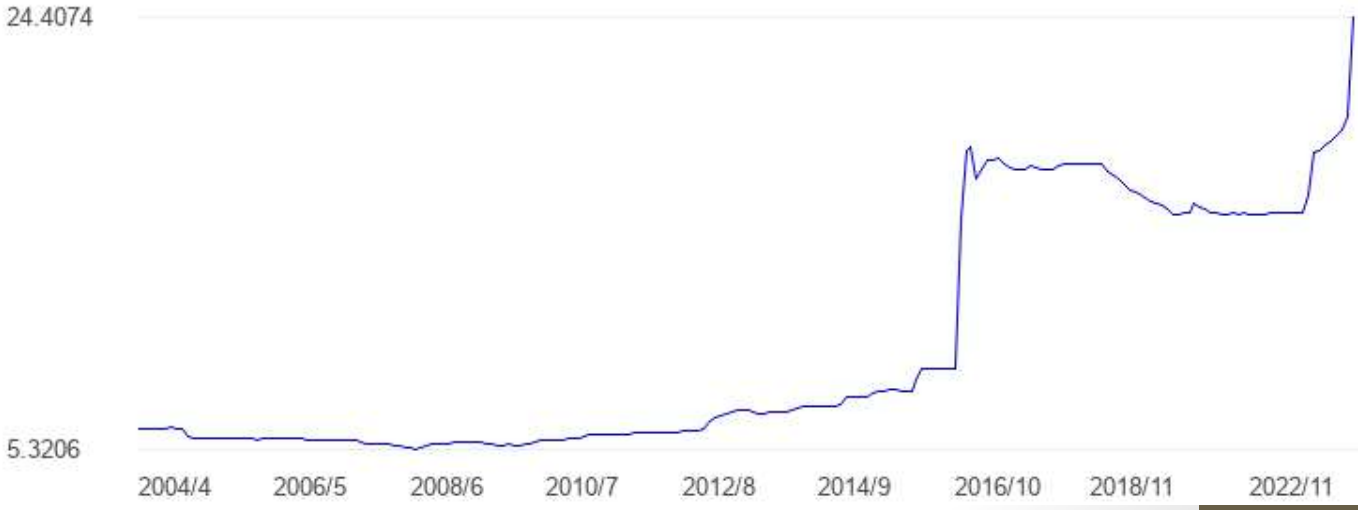
Head mounted displays

- Video Microsoft Holo Lens

Visualization







Brain computer interfaces

Intuitive Interfaces

Augmented Reality

Tangible User Interface

Assignment 1

- Write 1 paragraph for the future of any of the above technologies in 2035

Test your self

- **www.kahoot.it**