Visitor experience and digital media
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User experience

• Natural user interface
• Emotional responses
User interfaces – history in one slide

• Past (ish): Command Line Interface
• Now: Graphical User interface - WIMP
• Near future: Natural User Interface (NUI)
Limitations of WIMP?

• From desktop PC to ubiquitous computing: is WIMP still relevant?
  – mobile devices?
  – Interactive screen in the street?

• What about 3D, virtual reality, augmented reality?
NUI, what is it?

• User interface that is invisible, or becomes invisible once learned.
• Quick transition from novice to expert
Touch
NUI is Much More than Touch
Touch-less
Gestures

- Both touch and touch-less emphasise gesture-based interaction
- Interpreting human gestures
  - Sensor v computer vision
  - Any body motion especially hands (and fingers) and faces.
Tangible interface
Facial recognition and head/eye tracking

• Facial recognition: identifying or verifying a person from a digital image or video
  – Has been used as an input technique: affective computing

• Head and eye tracking – use in accessibility and assistive technology
Low-cost Brain Computer Interfaces in Rehabilitation

• Demonstrating that low cost EEG (Electroencephalography) devices can be used in rehabilitation applications with a reasonable accuracy
  – For instance, patients in neurorehabilitation units could benefit from emotion-aware assistive technologies.
  – Practitioners dealing with learning disorders could also make use of such an emotion-based training system to improve their effectiveness and efficiency.

• Ideas Factory Grant, used to evaluate the capability of low cost consumer EEG devices in recognising emotions
Low-cost Brain Computer Interfaces in Rehabilitation

• The project attempts to establish the connection between human emotions and EEG using low cost consumer devices
  – e.g. Emotiv head-set

• Collaborations with other Universities are underway to establish the feasibility of using such devices for environmental control and communication application
Behavior tracking

• Understanding of “work and life” behaviour – how people interact with each other, the pace of work/life, stress level, etc

• In collaboration with Lancaster Uni, Royal Holloway and Open Uni, funded by EPSRC

• Using mobile sensors such as GPS, accelerometer, etc, we aim to track people’s online and offline behaviour in real time
Older people and games

• The use of game technology to support rehabilitation for older people
• Funded by EPSRC
• Use of gesture-based interaction technology
• A collaboration with Silverfit, a Dutch company and AgeUK
Older people and games

• Two areas:
  – Occupational therapy – virtual kitchen and garage, allowing patients/users to practice daily activity
  – Users with dementia – memory games

• Main challenges:
  – Designing clinically appropriate virtual activities
  – Generalisability of skills learned in the virtual world to the real world
Aims

• The purpose of this study is to explore engaging and innovative ways of using technology to enhance the emotional and social experience of the heritage museum visitor
Powell-Cotton Museum

• Acquire information on how different groups of visitors emotionally relate to and engage with museum artefacts
• Gain an understanding of which Powell-Cotton Museum galleries and artefacts are most emotionally engaging to visitors and the reasons why
Relevance of Research

- Museums of every discipline and from all around the world are implementing new technologies to engage visitors in new and different ways.
- Museums are encouraging visitors to participate in and contribute to the making of the museum experience.
- Visitors want to learn but they also want to be entertained and see real artefacts.
- Emotional outcomes are now frequently recognized as being a valid form of learning.
- In order to maximise the personal nature of learning, museums should build emotion into the learning experience.
- Emotional responses can inspire visitors to learn more about an object or topic as well as enhance learning by making the experience more memorable.
- Visitors who feel an emotional connection to a museum’s collections are more likely to contribute to community engagement in the form of repeat visits, donations, membership, and volunteer labor.
HCI Design in Museums –
General Guidelines and Recommendations

- Design should focus on the visitor experience; only when the intended visitor experience is decided should the museum begin to look for technologies to implement and support it.

- Technology should add value to the experience which should be obvious to visitors.

- Technology should focus on providing the best support for museum and visitor experience goals rather than trying to be all things for all people.

- Understanding the audience is important in order to create an experience that appeals to them and resonates with them.

- The effects of colour, interactivity, navigation and other media or instructional strategies on learners should be highly considered because these affect different age groups in different ways.

- Visitors do not care if the museum is first to implement a technology; it’s better to combine the best practices.
Emotion and HCI Research

3 Theoretical Perspectives on Emotion and Design

1. Affective Computing – Picard
   – Built on cognitivism
   – Adapts to user’s emotional responses which can change how user interacts with system and therefore improve user experience
   – Proposed an emotion model built on Russell’s Circumplex Model of Affect relating phases of learning to emotion which would keep track of what emotional state a student is in and from that decides what help is needed

2. Affective Interaction - Höök
   – Based on constructivism
   – Views emotions as constructed in interaction; user expresses an emotion to the system intentionally
   – Make emotional experiences available for reflection

3. Technology as Experience - Höök
   – Can not just focus on emotion when designing; emotion is a part of the entire experience