Lecture 9
Emerging Paradigms
Learning Objectives

- Surveying opinions of trends in the discipline
Exercise #1

- From your perspective of technology and HCI, what do you think will be some of the emerging paradigms?
Non-Rigid HCI

- Boem and Troiano 2019
- Deformable input

Figure 2: Types of shapes for deformable interfaces; © Troiano & Boem
Human-Centric Software Engineering

- Grundy 2020 - Bias

- Gender bias – UIs, seat belts, health app
- Ethnic bias – over-recommend minorities for search, don't recognize faces
- Culture bias – inappropriate words, phrases, colours, icons, workflow
- Language bias – over-technical, wrong dialect, impersonal
- Age bias – too complex, too simple, inappropriate words, symbols, workflow
- Physical challenge bias – gesture, sound, sight, voice inappropriate
- Cognitive challenge bias – raise anxiety, poor fit to mental model
- Enjoyment bias – boring, unengaging, distracting
- Emotional bias – stressful, anxiety-inducing, frightening
- Personality bias – workflow, lack of engagement, disconnected
Human-Centric Software Engineering

- Grundy 2020

Future work

- Adding Emotions, accessibility, personality etc -> UML etc models
- Capturing, using further human-centric issues: values, emotions, usability, accessibility, culture, language, gender, age, ... & evaluating software for these
- Incorporating multi-lingual, multi-cultural aspects into requirements, design
- Deep learning + design critics + PM
- Agile SE Team Climate Inventory & applying in practice
- Personality of requirements engineers, software architects, project managers
- DSVLs for Big Data applications, end user config incl security
- Better principles, tools for human-centric DSVL design & evaluation
HCI in the 5G Era

- Zhao et al. 2020

1. Natural Interaction
   - NUI: tapping thumb; finger pressure; lip reading; etc
   - BCI (Brain-Computer Interface)
   - Affective computing: incorporating your emotions
   - Life scenarios: smart home; smart car; etc

2. Multimodal Display
   - Virtual environment technology: VR; AR; holographics
   - Multisensory fusion technology: many channels of stimulus
   - Life scenarios: tactile interactions
3. Virtual Identity
   - Virtual avatar: social interaction (Zepeto); image management
   - Virtual idols: e.g., Hatsune Miku
   - Life scenarios: managing multiple personalities

4. Data in the Cloud
   - Big data in the cloud
   - Edge computing: compute close to consumption (e.g., AR)
   - Life scenarios: social and privacy implications of collated data
HCI Grand Challenges

- Stephanidis and Salvendy 2019
  1. Human-Technology Symbiosis
     - How humans live and work harmoniously with technology
  2. Human-Environment Interactions
     - Interactions with an entire technological ecosystem
  3. Ethics, Privacy and Security
     - Moral principles governing conduct of activities in HCI (design)
  4. Well-Being, Health and Eudaimonia
     - Ensuring advances provide a healthy and satisfying life for all
HCI Grand Challenges

- Stephanidis and Salvendy 2019

5. Accessibility and Universal Access
   - Serving those with disabilities and providing universal access

6. Learning and Creativity
   - Fostering individual growth across all backgrounds

7. Social Organisation and Democracy
   - Ideals of democracy, equality, prosperity and stability are pursued and safeguarded
Sources