Introduction to Human Computer Interaction

Week 1, Unit 1

CC7 Human Computer Interaction

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Introduction to Human Computer Interaction

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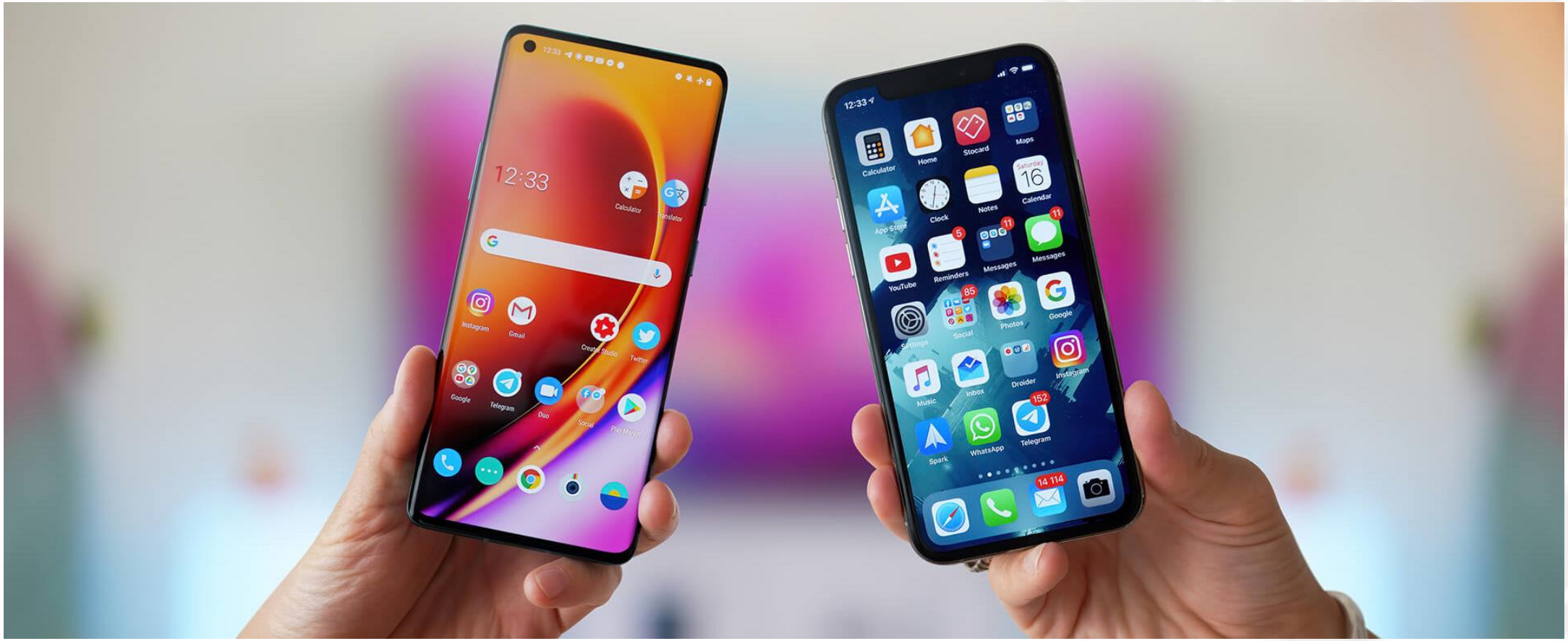
What is Human Computer Interaction (HCI)?

- Multidisciplinary field of study on the design of computer technology and interaction between humans and computers
- Concerned with the physical, psychological, and theoretical aspects of the processes
- Has since expanded to cover almost all forms of information technology design

Examples of Technologies



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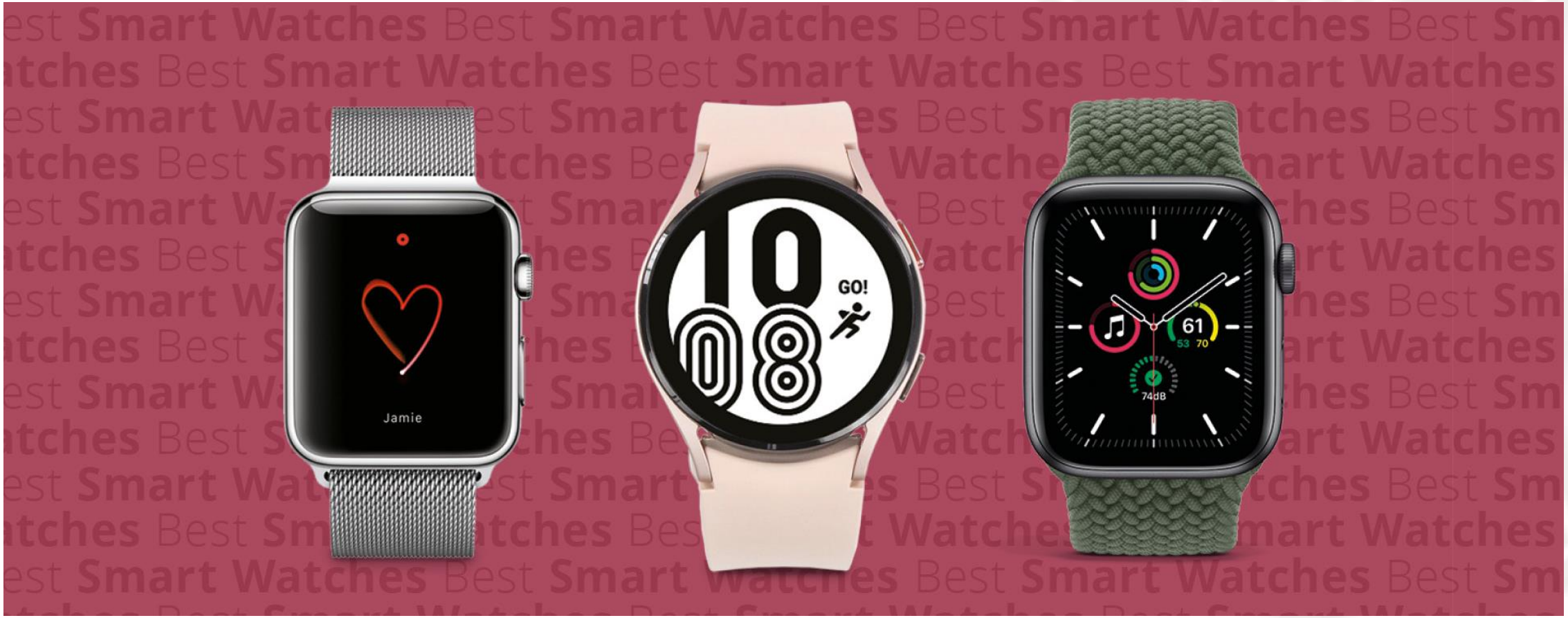

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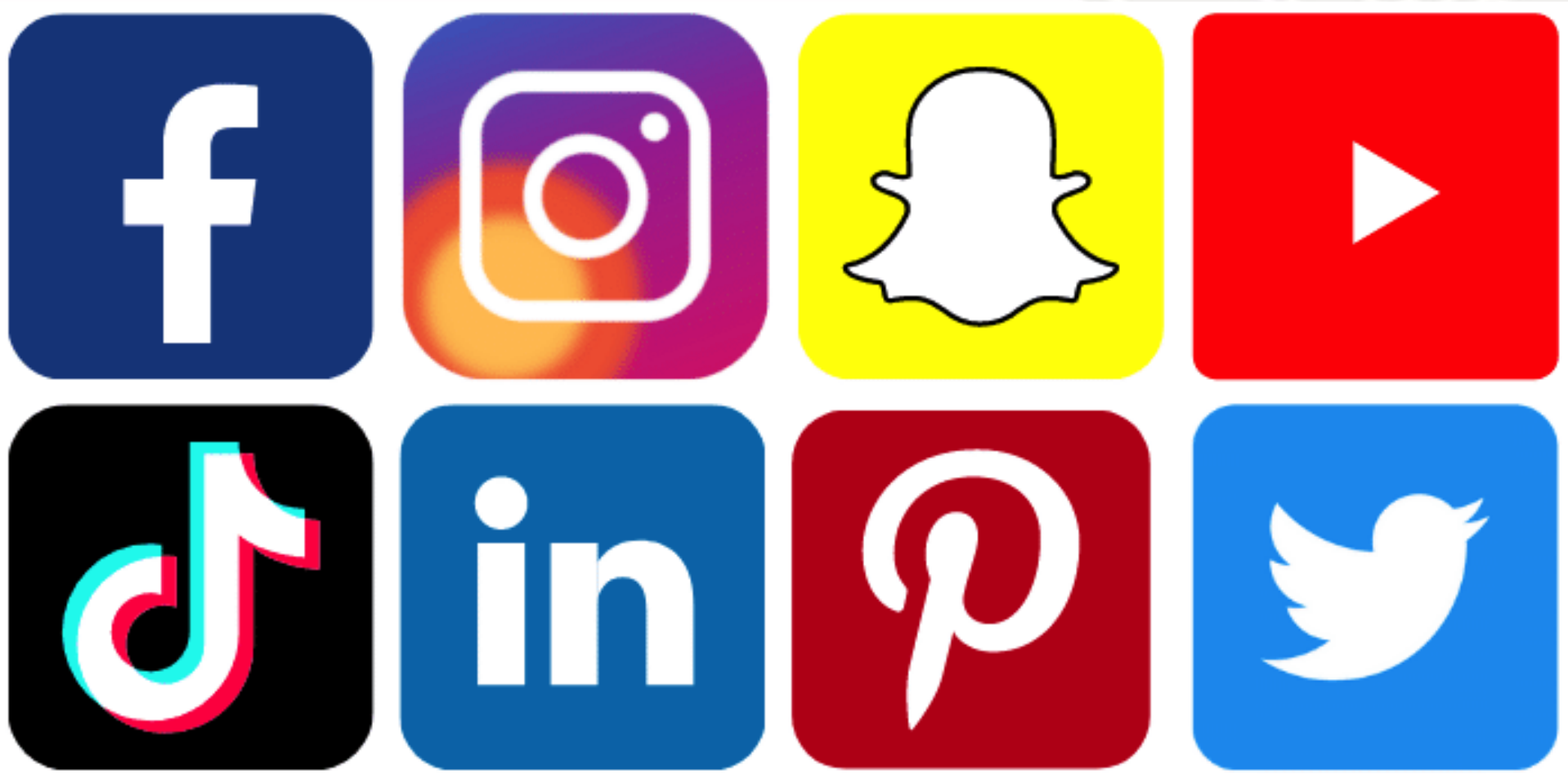

Technologies: Good v. Bad

- Is good or bad the right question?
- What makes a technology good or bad?
- How can we build good technologies?
- How can we verify or validate the goodness of our technologies?

Why HCI?

Errors / mistakes in computer technologies still exist today

- Focus on whether or not the technology works
- The concept is too cool / groundbreaking
- Functions are hard to utilize / process
- Specific people use things specifically
- Too much safety / security in the technology
- Too much focus on the design

Why HCI?

When creating technologies, it must be:

- Suitable for the task
- Easy to use
- Adaptable to the user's knowledge and experience
- Provides feedback on the performance
- Displays information in a format and pace understandable to the user
- Conforms to the principles of software ergonomics

Why HCI?

The idea of use is also necessary for HCI:

- **Useful –** accomplish what is required (play music, cook dinner, format a document)
- **Usable –** do it easily and naturally, without danger of error
- **Used –** make people want to use it, be attractive, engaging, fun

Four Components of HCI

Human | Computer | Interaction | Context

Four Components of HCI

- Human
- Computer
- Interaction
- Context

The Human

- Also known as the user / end-user
- Limited in their capacity to process information
- Has important implications for design
- Focuses on **who** the HCI is for

The Human

- Information is received and responses given via several input and output channels:
  - Visual
  - Auditory
  - Haptic channel
  - Movement

The Human

- Information is stored in memory
  - Sensory memory
  - Short-term (working) memory
  - Long-term memory

The Human

- Information is processed and applied:
  - Reasoning
  - Problem solving
  - Skill acquisition
  - Error

The Human

- Emotion influences human capabilities
- Users share common capabilities but are individuals with differences

The Computer

- Focuses on **where** the HCI is found
- Comprises various elements, each of which affects the user of the system
  - Input devices
  - Output display
  - Virtual reality systems
  - Various displays (physical controls, haptic dieback, sensors)
  - Paper output and input
  - Memory
  - Processing

The Interaction

- Interaction models help us to understand what is going on in the interaction between user and system
- Address the translations between what the user wants and what the system does
- Focuses on **what** the HCI is

The Interaction

- Ergonomics are physical characteristics of the interaction and how these influence its effectiveness
- Dialog between user and system is influenced by the style of the interface
- Interaction takes place within a social and organizational context that affects both user and system

The Context

- Also known as paradigms
- Examples of effective strategies for building interactive systems to design usable interactive systems
- Focuses on **how** the HCI will be formed
- Ranges from the introduction of timesharing computers, through the WIMP and web, to ubiquitous and context-aware computing