



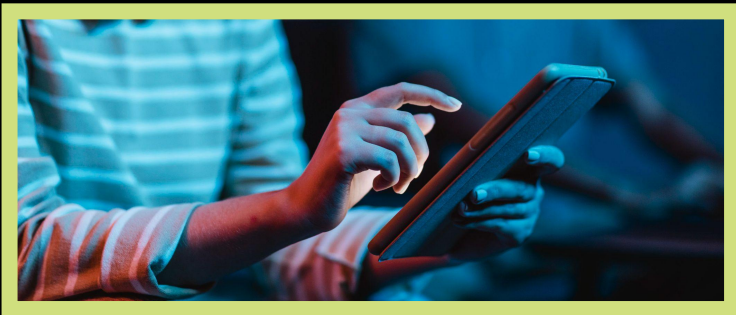
# Interfaces

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01

What are  
interfaces?



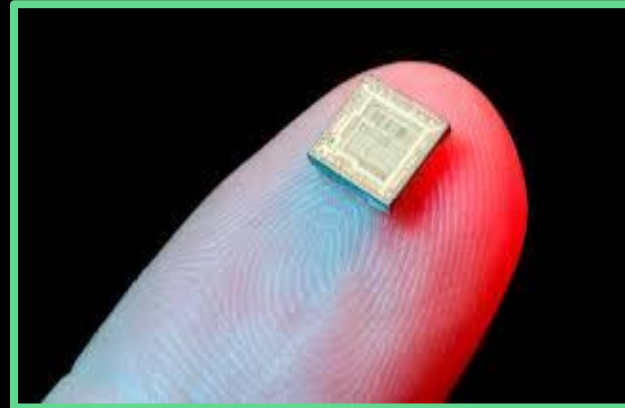
# Interfaces

Interface have several definitions. Some of these definitions are:

- Interfaces are systems that are used for operating computers. This system controls the way information is shown to a computer user and the way the user is able to work with the computer.
- The place or area at which different things meet and communicate with or affect each other.
- An area or system through which one machine is connected to another machine.

# Interfaces

Interfaces come in many shapes and sizes, from a microchip to a building.  
(Even tiny houses.)



# Interfaces

Everyone has seen and used interfaces in their lives. From steering wheels, traffic lights, remote controls, and even phones.

This is the TV remote that I use almost daily. As you can see it's not as simple as an apple TV remote. While it's easy for me to use since I've had it for over a year this interface is lacking navigation simplicity. While it's not as complicated as earlier remotes we see a lack of simplicity compared to competitors.



# Interfaces

In 1999, Deborah Kreuze wrote an article for MIT Technology Review on 10 breakthrough interfaces in the 20th century.

Loudspeaker

Touch-Tone Telephone

Steering Wheel

Magnetic Stripe Card

Traffic Light

Remote control

Cathode Ray Tube

Liquid Crystal Display

Graphical User Interface

Barcode Scanner

# Interfaces

George Carlin at traffic light.



# Interfaces

Dr. Kardas asked CS students in 2002 what interfaces they can think of. Original responses included:

- Body armor - stopping bullets/knives from damaging the wearer's vital organs
- Elevators - A few of SAU's buildings were retrofitted with elevators
- Shoes
- Toilet paper
- The drive-through
- Automatic transmission - Mostly computer controlled these days



# Interfaces

A lot of digital interfaces we use are individual software applications.

For example, music composers use software to make their pieces, even when music notation software may not be well-designed.



02

# Human - Computer Interaction



# Human-Computer Interaction (HCI)

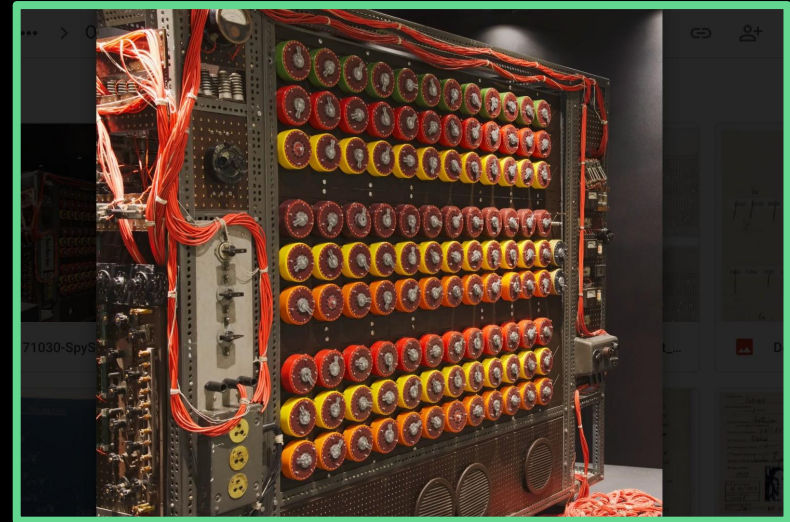
Human-Computer Interaction is the way that humans interact with digital systems. This can include physical devices such as phones and tablets. Cognitive science plays a vital role in the development of efficient interfaces that are in sync with human cognitive capabilities. For example attention, memory, decision-making processes, etc. This entails comprehending how users perceive information, execute commands, and interpret feedback received from the system.



# Human-Computer Interaction (HCI)

Human-Computer Interaction began as early as the first mechanical computer, the Analytical Engine from 1871.

World War 2 brought many innovations such as code-breaking machines (like the Turing-Welchman Bombe) that directly inspired the development of the first computers, which were mostly systems developed for the military.



# Human-Computer Interaction (HCI)

- Human-computer interfaces are essential elements to modern computing systems. Involving the techniques and tools used for human-computer and human-digital device interactions. This encompasses the design, development, and assessment of interfaces that enable effective communication and collaboration between humans and machines. Drawing from various disciplines such as computer science, psychology, design, and ergonomics, human-computer interfaces aim to create interfaces that are user-friendly and effective.
- Human-computer interaction plays a part in how our computers can be used, and how companies can improve user experience with their products. This field pioneers in understanding how our ever-developing computer technology touches us.
- Because of how far computer interfaces have come, computer technology is easier to use for billions of people.

# Human-Computer Interaction (HCI)

Machine learning is on its way to transforming human-computer interaction, making systems more intuitive, personalized, and efficient. ML algorithms are constantly adapting from data in how users interact with the technology; the primary catalyst to the machine learning/artificial intelligence revolution.

- Natural Language Processing
  - Voice Assistants and Conversational Interfaces create virtual assistants like Siri, Alexa, Cortana, etc. User feedback enables ML language processing to adapt in processing language.
- Computer Vision
- Deep Learning and Research

# Human-Computer Interaction (HCI)

Brain-Computer Interfaces have long been a speculation of science fiction, where we can connect our brains to computer systems to minimize the need for particular interfaces such as a keyboard or mouse.

As machine learning advances, the possibility for BCIs becomes more accessible as computer systems get more and more intuitive.

Rudimentary systems for brain-computer interfaces already exist, such as robotic prosthetics which use small sensors on the brain to control a robotic limb as if it is your natural limb. ML could revolutionize the entire field of bionics within the next couple decades.



03

# Web Design Interfaces



# Web Design Interfaces



Web design interfaces encompass the visual and interactive components of a website that users utilize to navigate, complete actions, and interact with digital materials. It's important to have effective web design interfaces in order to develop and easy-to-use online experience.

# Web Design Interfaces

- We can use the class website as an example. The layout of the content such as the header and navigation menu as well as links that help the students move between different pages and sections of the website.

## Courses Page **Edward P. Kardas**

Updated: 2024-02-14

- **SPRING 2024 COURSES at SAU**
  - [Cognitive Science \(PSYC 3303\) FACE TO FACE ONLY](#)
  - [History of Psychology \(PSYC 4043\) FACE TO FACE ONLY](#)
  - [Sustainability of Natural Resources \(HC 3013\) HYBRID](#)
- **SPRING 2024 COURSES at TAMU**
  - [History of Psychology \(PSY 403\) ONLINE ONLY](#)
- **FALL 2024 COURSES at SAU [the courses below are UNDER CONSTRUCTION]**
  - [General Psychology \(PSYC 2003\) ONLINE ONLY](#)
  - [Physiological and Comparative Psychology \(PSYC 3093\) ONLINE ONLY](#)
  - [Honors Seminar \(HC 2013\) FACE TO FACE ONLY](#)
- **YouTube Videos (courtesy of Jim Reppert, Kandice Herron, and Carey Baker)**
  - (1992 Reppert) <https://www.youtube.com/watch?v=VPNT8S:AVN4&list=PLpi64qo13jLn6YLUtUn-EvHVBohoJlfbx&index=4>
  - (1997 Reppert) <https://www.youtube.com/watch?v=9TMI3Sy3t9g&list=PLpi64qo13jLn6YLUtUn-EvHVBohoJlfbx&index=40>
  - (2003 Reppert) <https://www.youtube.com/watch?v=QpUIFyzD-dw&list=PLpi64qo13jLn6YLUtUn-EvHVBohoJlfbx&index=181>
  - (2023 Herron & Baker) [https://www.youtube.com/watch?v=mB\\_4Mxclnrw&t=3s](https://www.youtube.com/watch?v=mB_4Mxclnrw&t=3s)
- **Honors College**
  - [HonorsOnline Guide.pdf](#)
  - See below for pictures of Director Ed Kardas over the years



# Resources

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- Damyanov, M. (2023, April 16). *Human-Computer Interaction: Definition, Principles & Examples*. Dovetail. Retrieved April 2, 2024, from <https://dovetail.com/product-development/human-computer-interaction/>
- IABAC Editors. (2023, September 5). *How ML is Changing Human-Computer Interaction*. Medium. Retrieved from <https://iabac.medium.com/how-ml-is-changing-human-computer-interaction-a2f3c53f301c>

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<http://peace.saumag.edu/faculty/kardas/Courses/CogSci/topinterfaces.html>