Screenless Displays

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B4

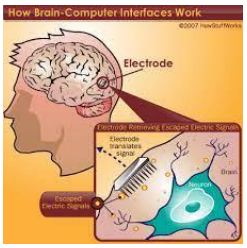
Overview

Background

- Three types of Screenless Displays
  - Visual Image-VRG, HUD
  - Retinal Display-VRD
  - Synaptic Interface
- Google Glass- first tech closely related

HUD (Heads Up Display)

VRG



Synaptic Interface

- First technology closely related to screenless display is Google Glass, which is worn by users as glasses. Help users communicate with the computer via Natural Language Processing.
- Screenless displays are an intelligence technology- it helps humans process info and view the world.
- **Visual Image** - Most common form of screenless display, light deflected from intermediate object before reaching the viewer's eyes.
  - Ex: Holograms, VR (Virtual Reality) goggles, and Heads-up Display in airplanes.
  - HUD (Heads Up Display)
    - Transparent displays
    - Aircraft and possibly cars
  - VRG (Virtual Reality Goggles)
    - VR headsets
    - Physical object on eyes
- **Retinal Display** - Includes images reaching the retina of viewer's eyes. No screen, projector, no source of deflection or reflection. Only shown to viewer's eyes.
  - VRD (Virtual Retinal Display)

        - Image projected onto retinas
        - augmented reality
- **Synaptic Interface** - Form screenless technology: includes images, but reaches to the brain instead of the retina. Information transmitted directly to viewer's brain. Helpful for blind people. Also called Brain Machine Interface.

Background

- Google Glass + app (MindRDR)
- Closest thing to official screenless displays
- Sensor picks up brainwaves
- Correlates with focus
- Mostly hands free

Google Glass: Reading your mind with new app

- Started with just the glasses
  - App was added later on
- Around $1,800 if you wanted to buy now
- Still in research and not yet reviewed or approved by Google
- Simple set up and work

History

When were Screenless Displays invented?

- Visual Image: 1826-1827
- Retinal Display: 1986-1992
- Synaptic Interface: 1969 - 1970

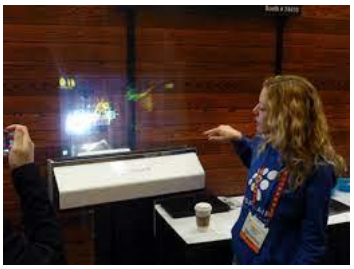
Joseph Nicéphore Niépce

Thomas Furness

- **Visual Image** - Invented by: Joseph Nicéphore Niépce, a French scientist.
- **Retinal Display** - Idea from Kazuo Yoshinaka in 1986.
  - Invented the idea in University of Washington by Thomas Furness and his colleague Joel S. Kollin. Completed project either 1991-1992.
- **Synaptic Interface** - Invented around 1970s in California in University of California, Los Angeles by testing on Monkeys.

Plan and Implementation

- Gaming
- Health/medical
- Transportation
- Consumers
- Industries/Factories/marketing



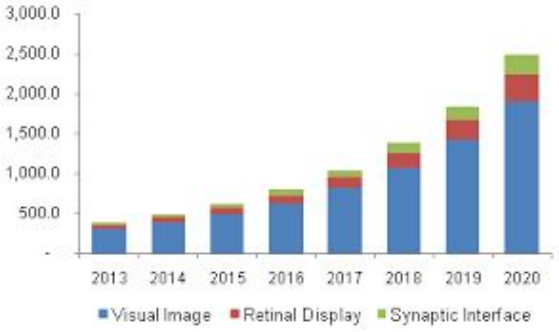
Pros

- No toxic materials used to build
- Doesn’t take up much space
- Better quality and less power
- Helps visually impaired & older people
- Easy to carry & access

❖ VRG & VRD would help the visually impaired and those who start to lose vision as they get older

Cons

- Expensive
- Uncertainty- still still in research
- Limited availability
- Resources needed



- Synaptic Interface is still in research- as it's the direct transmission of images to the brain with an object placed "into" the head- seems sketchy to some
- Very costly especially when it comes to cost of producing it and the materials needed
- Aren't available to everyone

Summary

Screenless Displays are greatly beneficial, organized, and minimalistic!

- Screenless Displays is greatly beneficial to businesses, factories, industries, consumers, and more! It can greatly impact and help improve the development in them by faster research, reach to consumers, produce, minimization, etc. Also being able to manipulate with the images' sizes.
- Minimization can help save room and space. Also can help save data. Includes transmitting files, data, or/and images.
- Screenless Displays can also help stay organized during research by minimizing amount of files/data or manipulating the sizes that takes up space.

References

Screenless Displays: The Real Life Holograms – The Hawk Eye

Screenless Display Market Size, Share and Analysis | Forecast - 2030

Screenless Displays- The Emerging Computer Technology

Emerging Technology: Screenless Display and their Types

Need-know-screenless-display-technology

Background slide references: Ncbi.nlm.nih.gov/pmc/articles , Nationalgeographic.com/photography/article/milestones-photography , Sociology/retinal_scanning_virtual_retinal_displays

Others: Screenless Display - Mepits , Screenless-Displays-Opportunities-Challenges-and-Risk-Factors ,