

VIRTUAL AND AUGMENTED REALITY



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Virtual Reality (VR) is the illusion of a three-dimensional, interactive, computer-generated reality where sight, sound, and sometimes even touch and smells are simulated to create pictures, sounds, and objects that actually seem real.

One of the identifying marks of a virtual reality system is the head mounted display worn by users.

These displays block out all the external world and present to the wearer a view that is under the complete control of the computer.



Augmented reality (AR) is computer-generated content, overlaid on a real world environment. AR hardware comes in many forms, including devices that you can carry, such as handheld displays, and devices you wear, such as headsets, and glasses.

An AR system adds virtual computer generated objects, audio and other sense enhancements to a real-world environment in real time.

Common applications of AR technology include video games, television, medical education, and personal navigation, though there are many other uses as well.

Current Uses of Augmented Reality

- The yellow first down line, used on TV broadcasts of football games:
 - Real world elements: football field and players
 - Virtual element: the yellow line is drawn over the image, by computers in real-time



Another example is the Pokemon Go phenomenon, several years ago for people to catch them on their cell phones and get points....



FUN ON THE
SNAPCHAT
WEBSITE !!



Current Uses of AR

- HUD (Head Up Display):
 - Used in commercial aircraft, automobiles, and other applications
 - Presents data without requiring the user to look away from his or her usual viewpoint



THE MAGIC OF AUGMENTED REALITY AT DISNEY

The folks at Disney's research division are working with augmented reality technology to make drawings literally come to life. They're using an app on a standard, consumer-grade tablet, and a normal coloring book colored with normal crayons.

You, or a child, or whoever, colors in the character on the page and the app does the rest of the work of bringing that drawing to life. So you color in your drawing:



<https://www.businessinsider.com/disney-augmented-reality-2015-10>

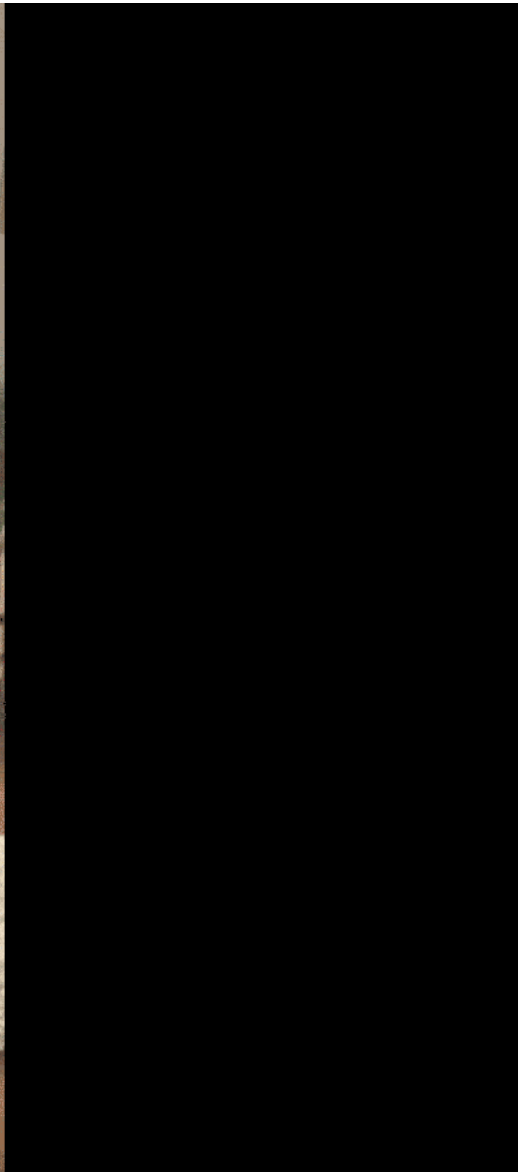
THE COLORING IS ALMOST DONE AND NOW ITS TIME TO ADD SOME BRIGHTER COLORS



AND HERE IS YOUR FINISHED COLORED IMAGE THAT IS SO HAPPY THAT IT IS DANCING !!



IKEA AND OTHER FURNITURE COMPANIES LET YOU SEE HOW DIFFERENT TYPES OF FURNITURE WILL LOOK IN YOUR HOME



Augmented Reality vs. Virtual Reality

Augmented Reality

- System augments the real world scene
- User maintains a sense of presence in real world
- Needs a mechanism to combine virtual and real worlds
- Hard to register real and virtual

Virtual Reality

- Totally immersive environment
- Senses are under control of system
- Need a mechanism to feed virtual world to user
- Hard to make VR world interesting

VIRTUAL REALITY - Virtual reality immerses you in a virtual world through the use of a **headset** with some type of screen displaying a virtual environment.

These headsets also use a technology called **head tracking**, which allows you to look around the environment by **physically moving your head**. The display will follow whichever direction you move, giving you a 360-degree view of the virtual environment.

TYPES OF VR DEVICES - At the moment, there are two major types of headsets. Both have their pros and cons, which you'll want to consider if you're looking to purchase one.

The first type has a **screen built in to the headset**. These devices connect to a computer and require a pretty powerful system to operate smoothly. They have great graphics and perform well, but they're also **pretty expensive**, ranging from about \$400 to \$800.

A few popular examples of these include the [Oculus Rift](#), the [Vive](#), and the [PlayStation VR](#), which connects to the PlayStation 4 game console.



Some of these devices come with **handheld controllers** that track your hands' movements as well, providing for a more interactive experience.

The other type of headset **houses your phone and uses its screen as the display.**

These don't require a computer and run completely off of apps on your smartphone. The graphics and performance levels on these headsets aren't quite as good as those with a built-in screen, but they do tend to be **much cheaper.**

Some popular examples include [Google Cardboard](#) and the [Gear VR](#).



You can buy the basic flat cardboard pattern and fold it up yourself, to make a viewer. It comes with 2 lenses and several other parts you will need.



Virtual Reality: Hardware

Head-Mounted Display (HMD)

- Helmet or mask providing visual and auditory stimuli
- LCD or CRT for stereo images.
- Option of built-in head-tracker and stereo headphones



Data Glove

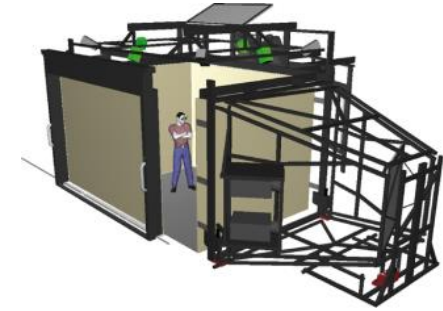
- Sensors on fingers plus position/orientation tracking
- Enables natural interaction with virtual objects



Binocular Omni-Orientation Monitor (BOOM)

- Head-coupled stereoscopic display device
- CRT for high-resolution
- Built-in tracking

Cave Automatic Virtual Environment (CAVE)



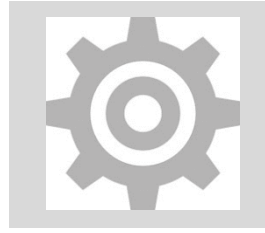
- Projection of stereo images on a room-sized cube
- Head tracking continuously adjust the projection to the current position of the leading viewer



Control Devices

- Control virtual objects in 3 dimensions (Joystick, mouse)

Virtual Reality: Fields of Application



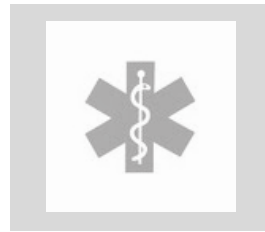
Design, engineering, manufacturing and marketing



Hazardous operations in extreme or hostile surroundings



Training in military and industrial machine operation,
medical teaching and surgery planning/training



Medicine and healthcare

[Marc-O-Matic](#), aka Marco Ryan, is best described as a multidisciplinary immersive media artist.

While his skillset includes everything from animation to interpretive design, he has a particular talent for combining artistic storytelling and technology – specifically augmented and virtual reality – to create some incredibly captivating and immersive artworks.



https://www.youtube.com/watch?time_continue=3&v=12D6zzCEKzA

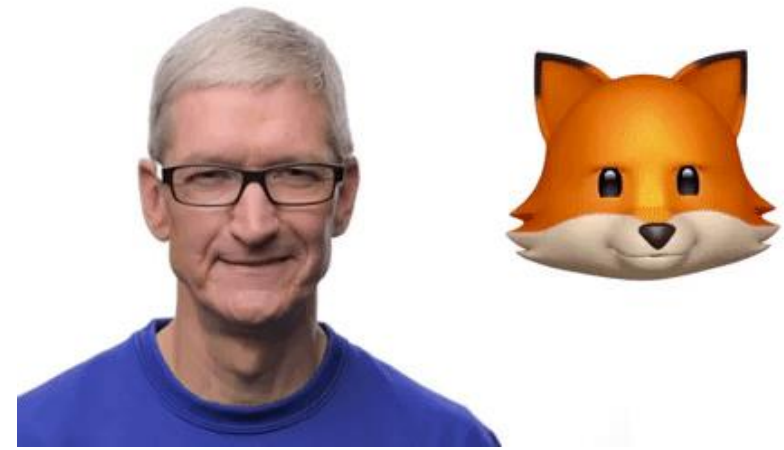
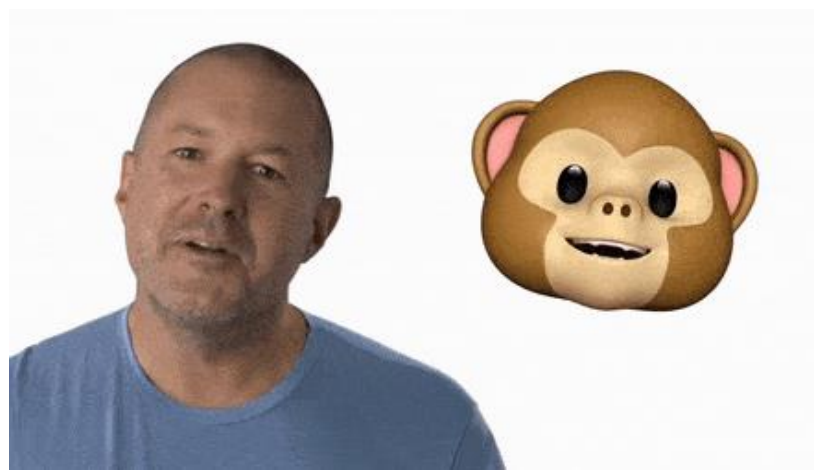
When you go to a Lego store, many of them have a machine that you can take the box of the item you want up to it and it will create a 3D moving model of the product.



<https://www.youtube.com/watch?v=0uqxsIQNUPU>

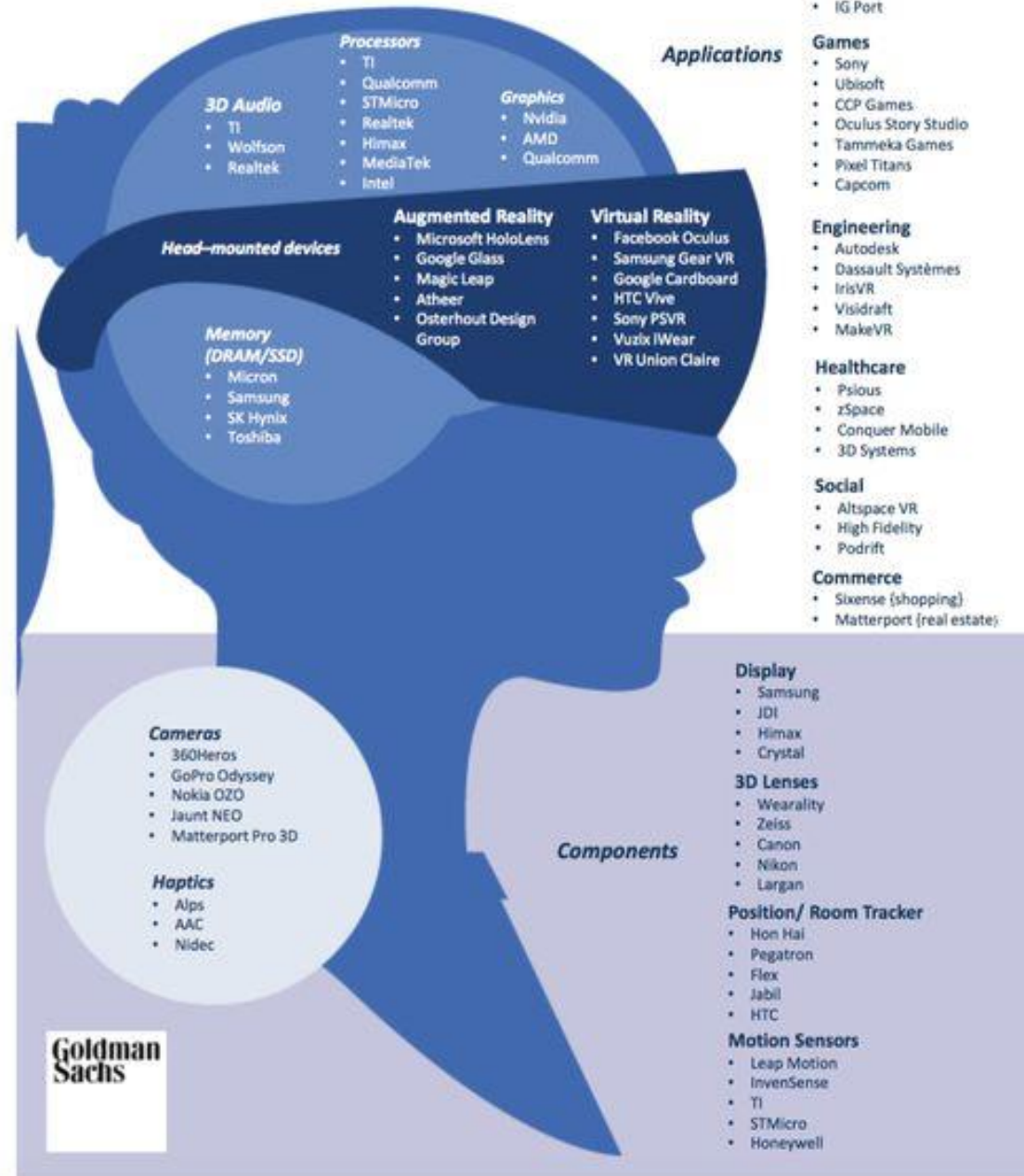


THE NEW APPLE iPhone LETS YOU PICK AN ANIMOJI TO GO WITH YOUR FACE, AFTER GETTING A FACIAL RECOGNITION OF YOU, WITH YOUR SMART PHONE



The Ecosystem

Virtual Reality / Augmented Reality



WHICH COMPANIES ARE LEADING THE VR MARKET TODAY?



Google
Daydream



Samsung
Gear VR



Oculus
Rift



Sony
Playstation VR



HTC / Valve
Vive





USE FOR CHOOSING THE RIGHT PAINT COLOR FOR YOUR ROOMS



COOL USES FOR MEDICAL EDUCATION !!



https://www.youtube.com/watch?time_continue=47&v=SKpKlh1-en0

HOLOPORTATION: VIRTUAL 3D TELEPORTATION IN REAL-TIME (MICROSOFT RESEARCH)



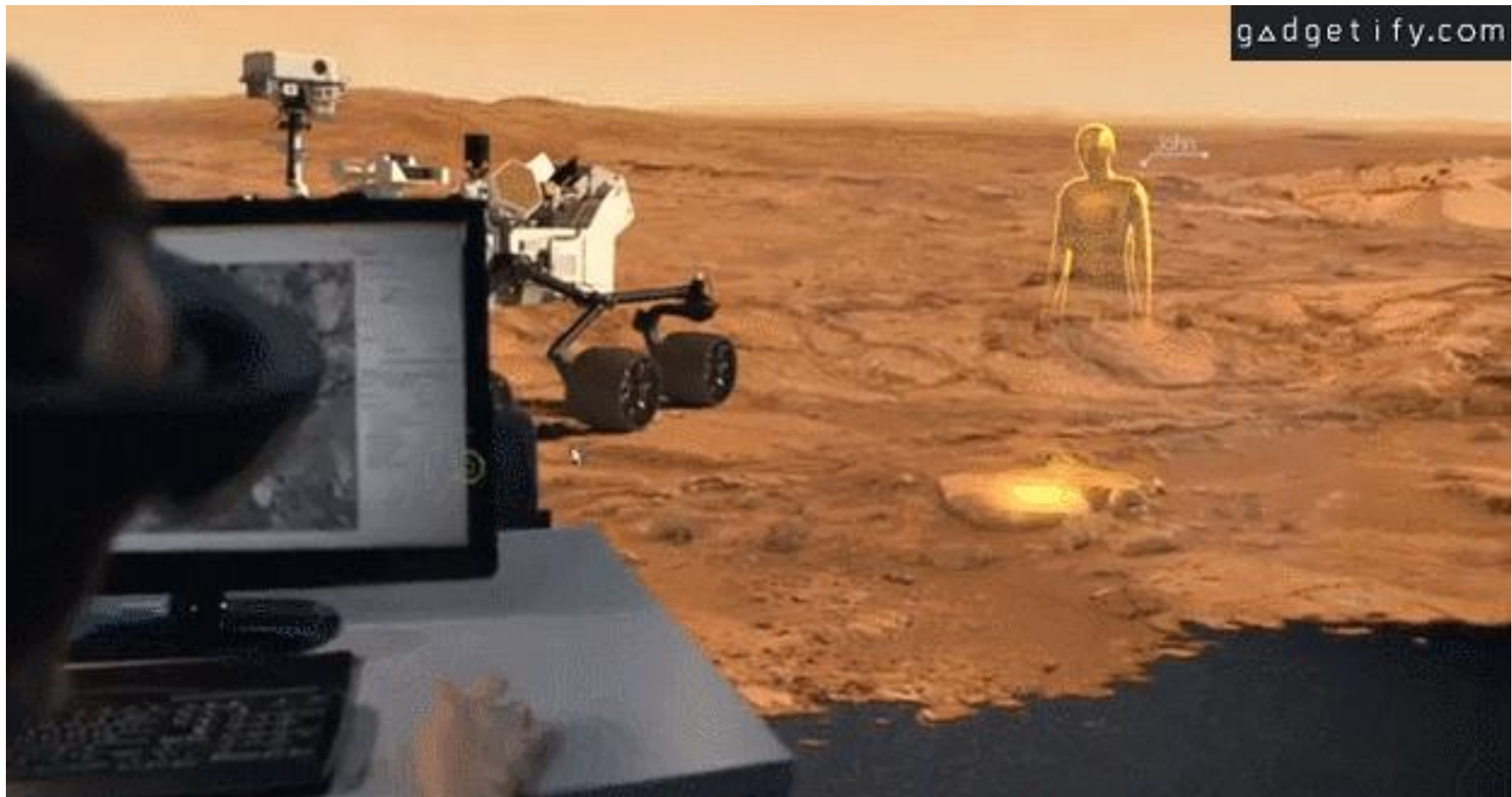
https://www.youtube.com/watch?time_continue=220&v=7d59O6cfaM0

MICROSOFT HOLOLENS: PARTNER SPOTLIGHT WITH FORD



<https://www.youtube.com/watch?v=3QyA7HhIYkg>

NASA'S MARS HOLOLENS DEMO



https://www.youtube.com/watch?v=IcJ-JuA_K7U

IRON MAN 2 AMAZING INTERFACES AND HOLOGRAMS



<https://www.youtube.com/watch?v=mRi1dmFgRfo>

THE BOOK – “BETWEEN WORLDS”: AUGMENTED REALITY IN STORYTELLING



<https://www.youtube.com/watch?v=YO1E7DBuqtc>

THE AMAZON WEBSITE HAS A LARGE SELECTION OF BOOKS AND CARDS FOR AUGMENTED REALITY



https://www.amazon.com/s?k=augmented+reality+books+for+kids&crd=Y9ONK2G13HOS&prefix=augmented+reality+%2Caps%2C242&ref=nb_sb_ss_i_3_18





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KIDWELLY CASTLE (Wales)



CAERLAVEROCK CASTLE (Scotland)



GOODRICH CASTLE (England)





HOW THE CLOCK SCENE WAS FILMED IN HAROLD LLOYD'S "SAFETY LAST" (1923)

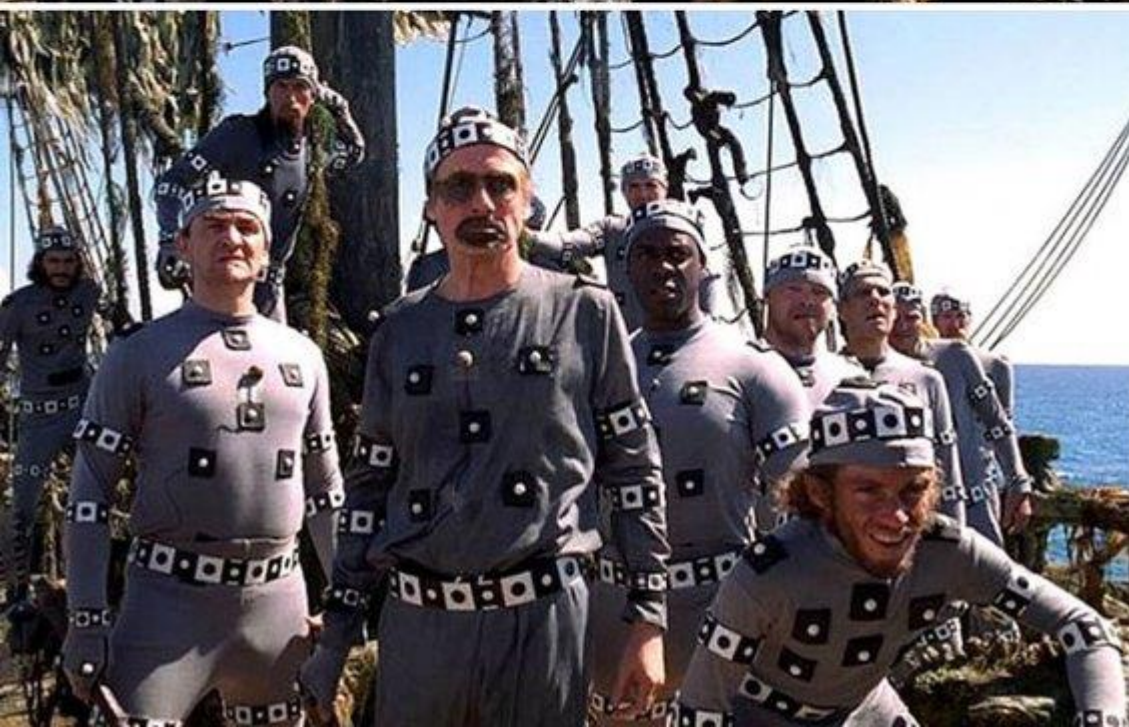




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Pirates Of The Caribbean



https://www.boredpanda.com/before-and-after-visual-effects-movies-tv/?utm_source=google&utm_medium=organic&utm_campaign=organic



**THAT DAY YOUR GRANDMA
WEARS A GREEN SCREEN...**





THE END !!