Introduction to
Augmented Reality
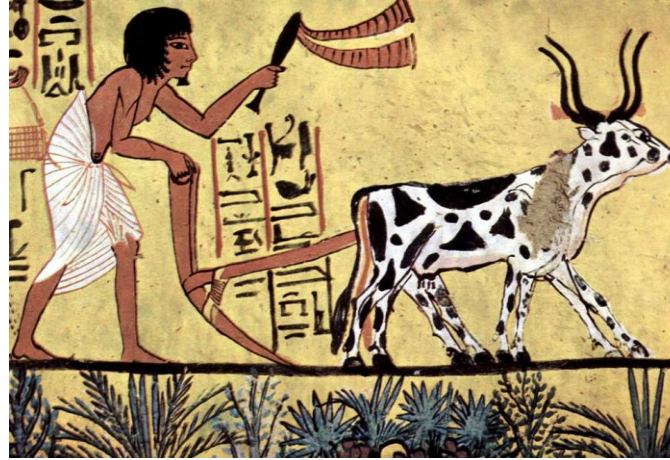## & Virtual Reality

Dr. Kaushal Kumar Bhagat
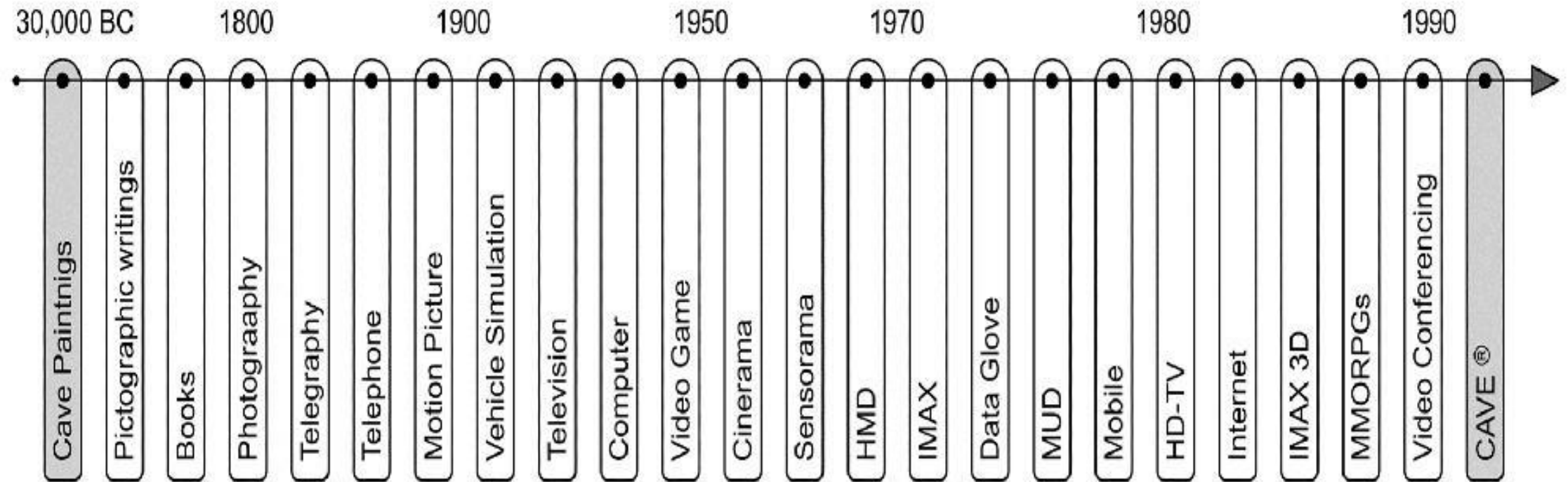Advanced Technology Development Centre

History of AR/VR

"When anything new comes along, everyone, like a child discovering the world, thinks that they've invented it, but you scratch a little and you find a caveman scratching on a wall is creating virtual reality in a sense. What is new here is that more sophisticated instruments give you the power to do it more easily." (Morton Helig)

Early History (30,000 BC -)

Timeline for Evolution of Communication Media

30,000 BC | 1800 | 1900 | 1950 | 1970 | 1980 | 1990

Cave Paintnigs, Pictographic writings, Books ®, Photograaphy, Telegraphy, Telephone, Motion Picture, Vehicle Simulation, Television, Computer, Video Game, Cinerama, Sensorama, HMD, IMAX, Data Glove, MUD, Mobile, HD-TV, Internet, IMAX 3D, MMORPGs, Video Conferencing, CAVE ®
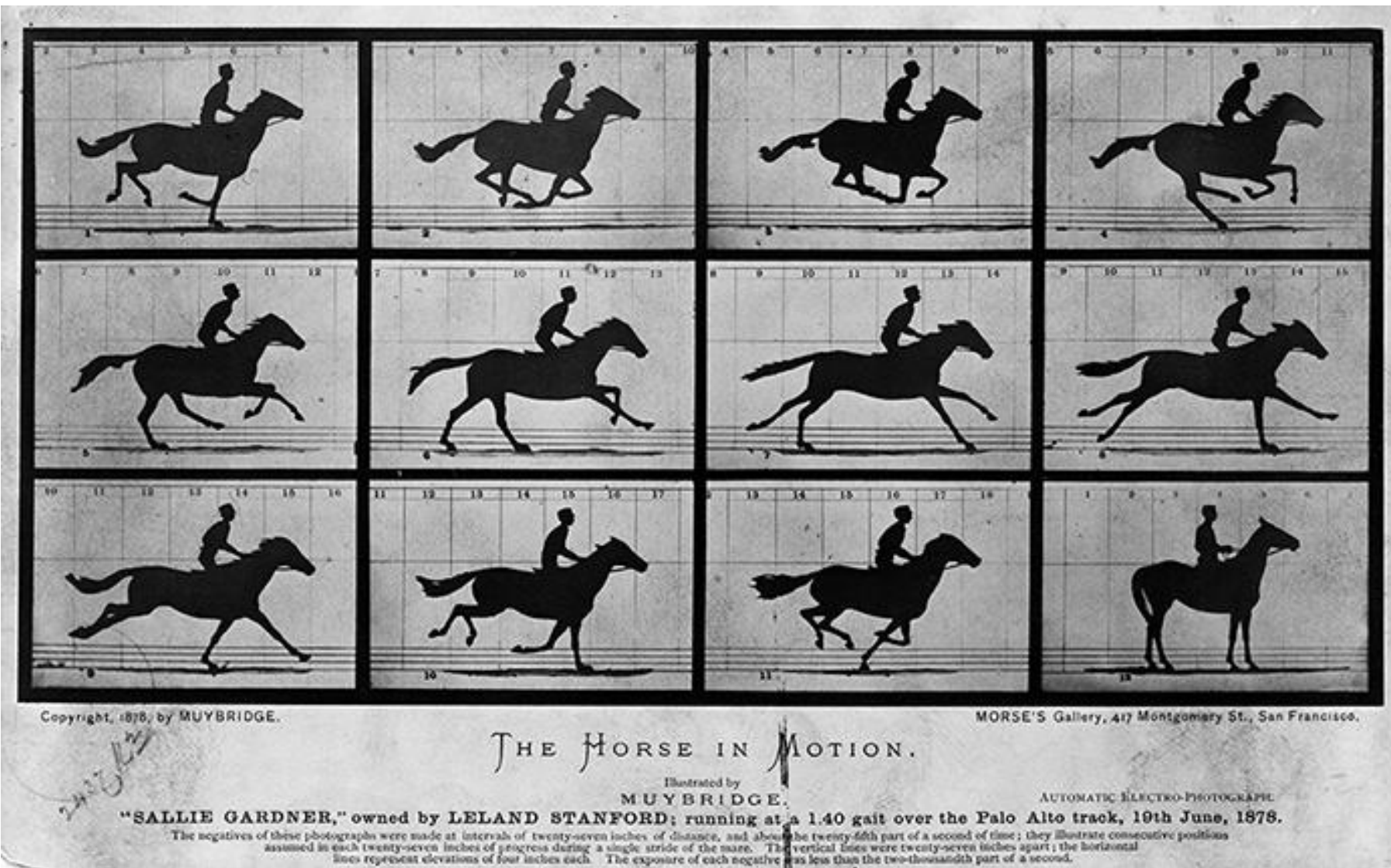
Animal painting in Chauvet Cave, France

The Sistine Chapel Ceiling

Boulevard du Temple, a Daguerreotype made by Louis Daguerre in 1838

The Horse in Motion by Eadweard Muybridge

The Arrival of a Train at La Ciotat Station

CHAP. XII.

How we may see in a Chamber things that are not.

I Thought this an Artifice not to be despised: for we may in any Chamber, if a man look in, see those things which were never there; and there is no man so witty that will think he is mistaken: Wherefore to describe the matter, Let there be a Chamber whereinto no other light comes, unless by the door or window where the spectator looks in: let the whole window or part of it be of Glass, as we use to do to keep out the cold; but let one part be polished, that there may be a Looking-glass on both sides, whence the spectator must look in; for the rest do nothing. Let Pictures be set over against this window, Marble statues, and such-like; for what is without will seem to be within, and what is behind the spectators back, he will think to be in the middle of the House, as far from the Glass inward, as they stand from it outwardly, and so clearly and certainly, that he will think he sees nothing but truth. But lest the skill should be known, let the part be made so where the Ornament is, that the spectator may not see it, as above his head, that a pavement may come between above his head: and if an ingenious man do this, it is impossible that he should suppose that he is deceived.

"*Let there be a chamber wherein no other light comes, unless by the door or window where the spectator looks in. Let the whole window or part of it be of glass, as we use to do to keep out the cold. But let one part be polished, that there may be a Looking-glass on bothe sides, whence the spectator must look in. For the rest do nothing. Let pictures be set over against this window, marble statues and suchlike. For what is without will seem to be within, and what is behind the spectator's back, he will think to be in the middle of the house, as far from the glass inward, as they stand from it outwardly, and clearly and certainly, that he will think he sees nothing but truth.*" – Magia Naturalis by Giambattista Della Porta (1584)
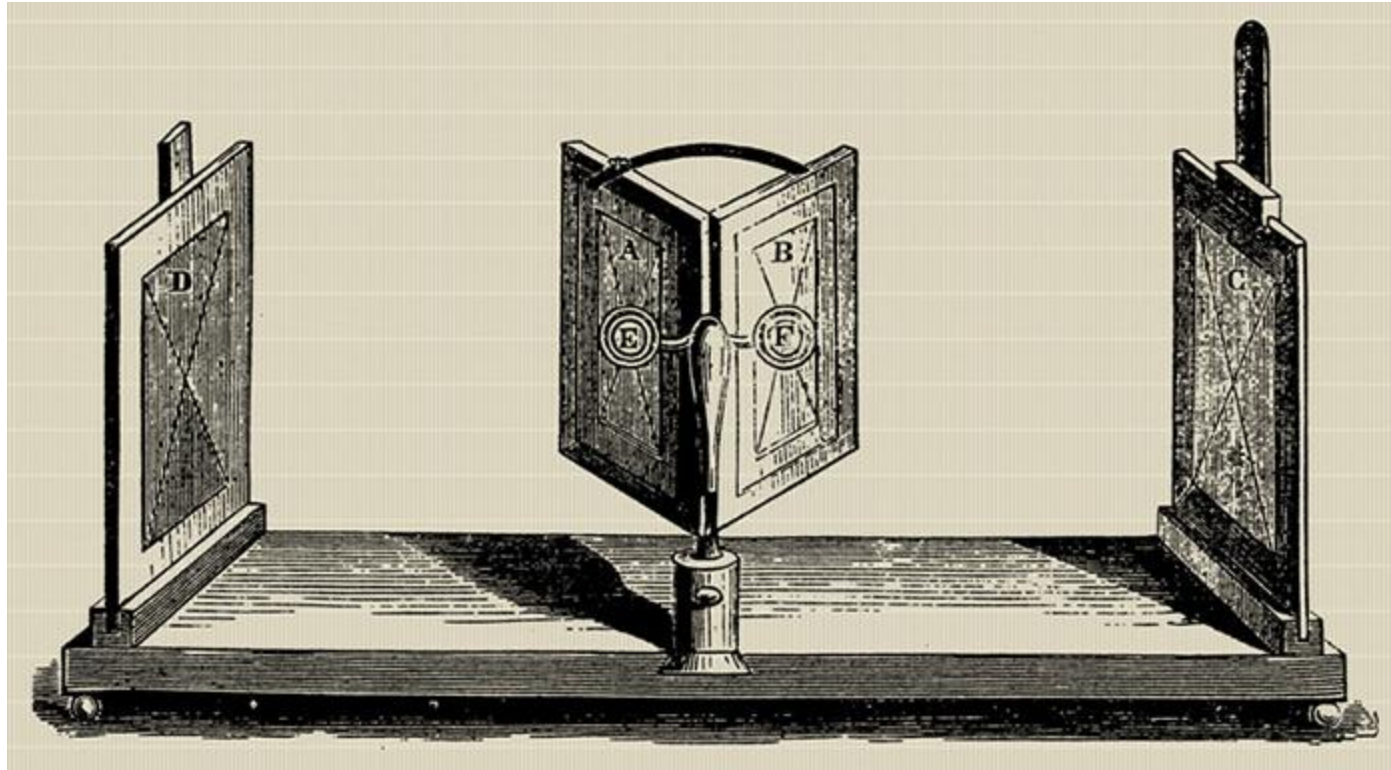
Pepper's Ghost (1862)
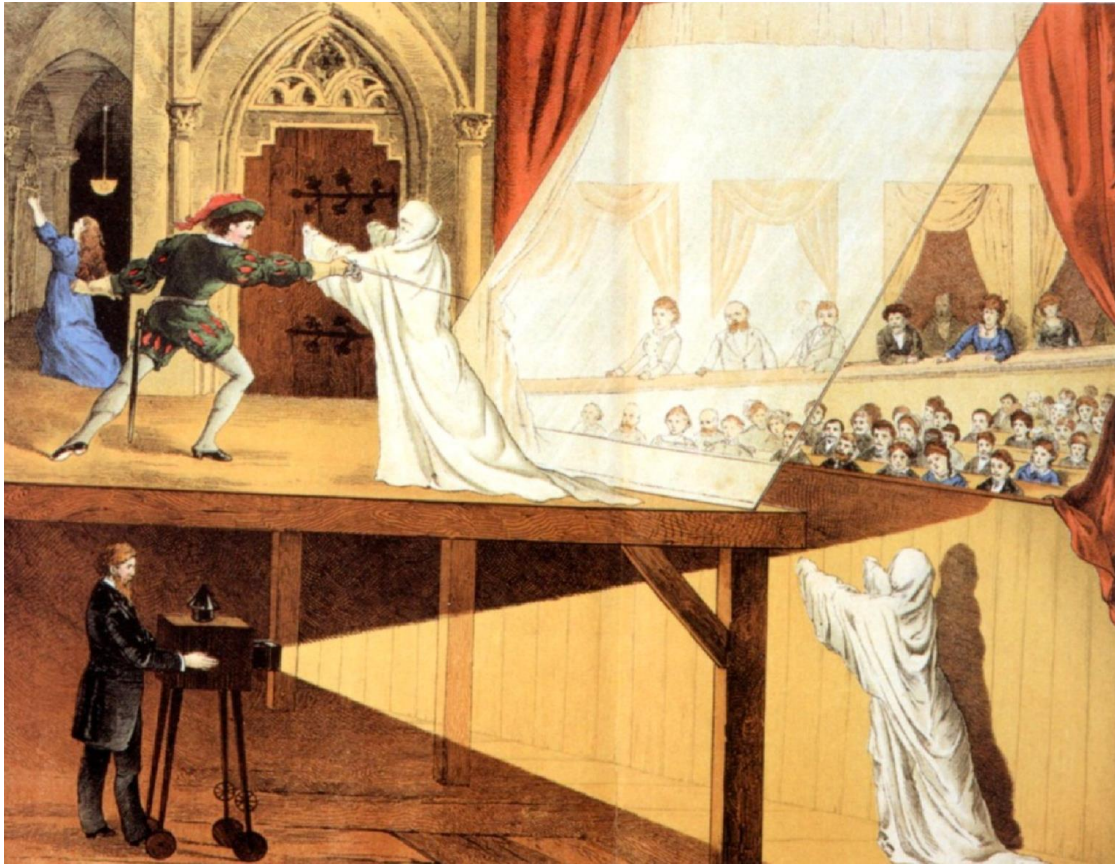
Stereoscopy

Stereoscopy is the process by which an illusion of depth is created in a flat image (photograph or a painting), by presenting slightly different images to the left and right eyes, making the experience similar to how we see things in reality.

1828: Wheatstone Stereoscope

1851: Brewster Lenticular Stereoscope

1891: Kinetoscope

1929: Link Trainer Flight Simulator

1957: The Sensorama (Morgan Heilig)

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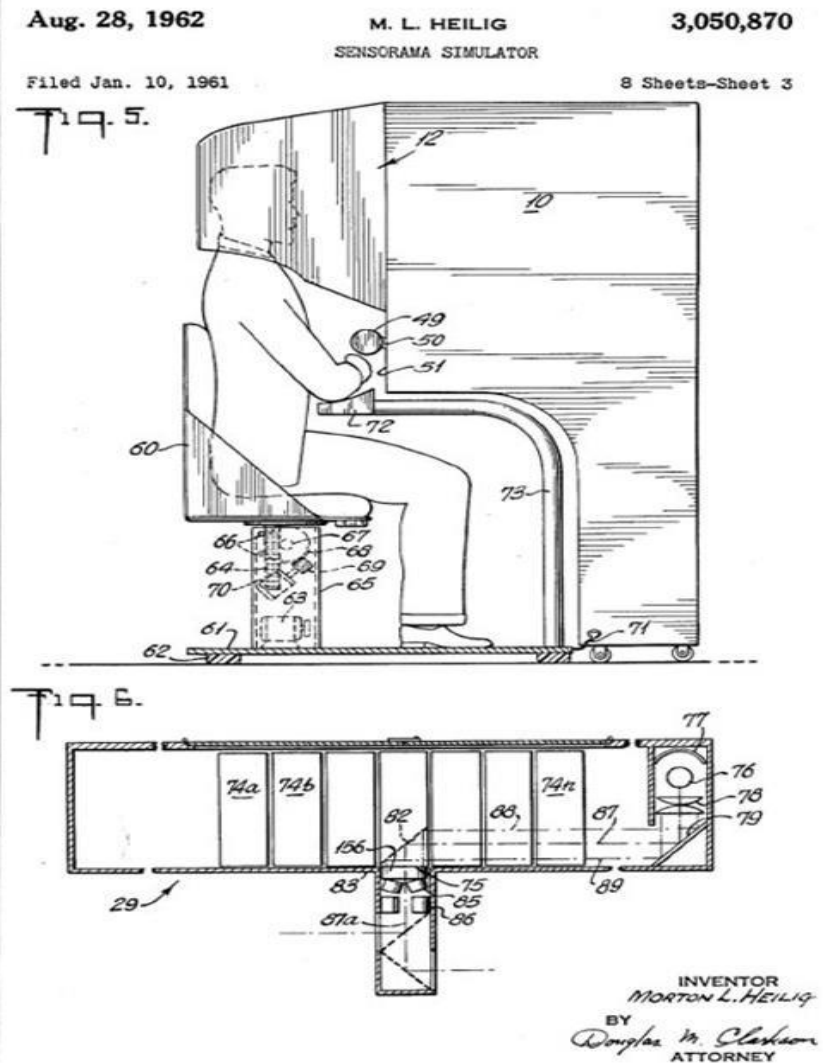
1960: Telesphere Mask (Morgan Heilig)

1961: Headsight (Comeau and Bryan)
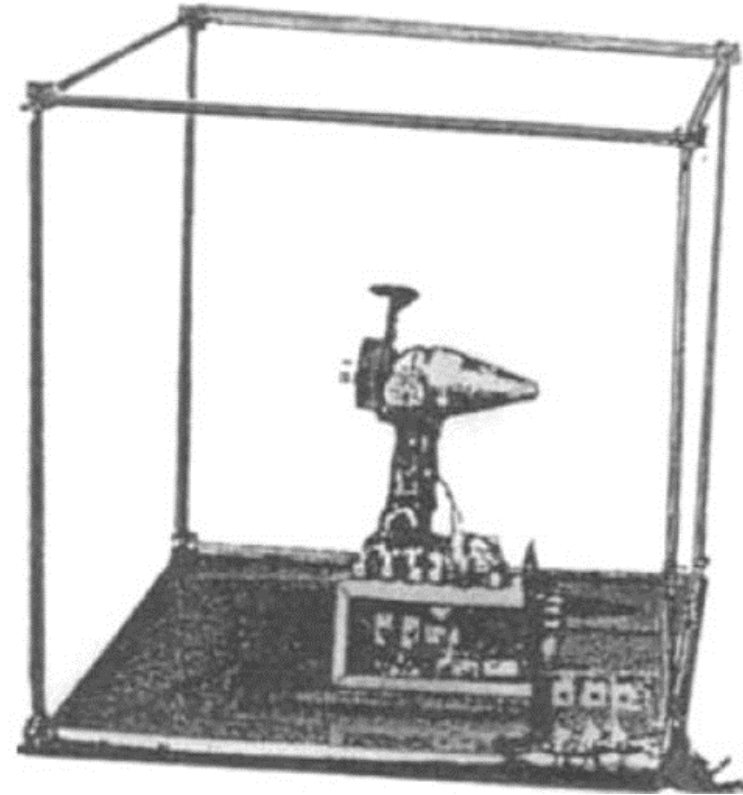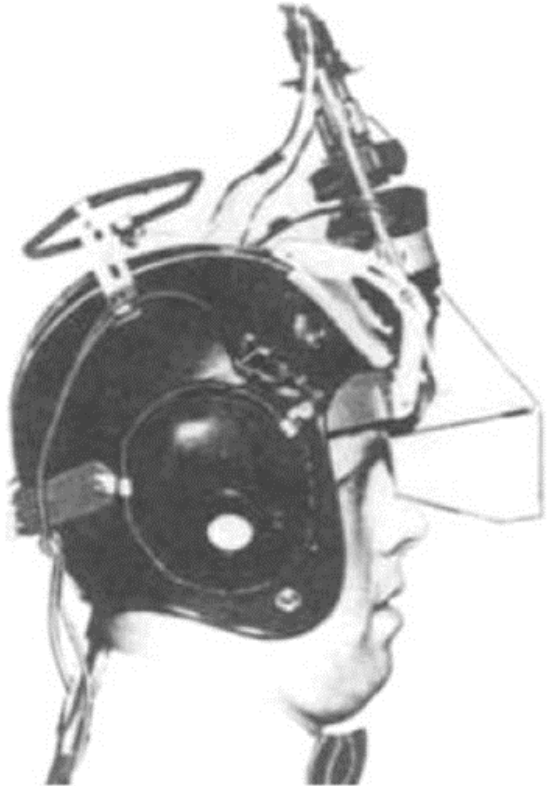
1968: The Sword of Damocles (Ivan Sutherland)

1980: EyeTap (the first portable AR device)

1986: The Super Cockpit program (Thomas Furness)

The Super Cockpit (1980's)

■ Furness - USAF

Videoplace: Myron Kruger

https://www.youtube.com/watch?v=dqZyZrN3Pl0&ab_channel=BarrieEllis

1996 - The Studierstube (Collaborative AR system)

1997 - Outdoor AR system

2014 - Google Glasses

Modern VR devices

AR/VR History Timeline

A walk through VR history

1960
Morton Heilig creates 'Sensorama' a multi-sensory simulator
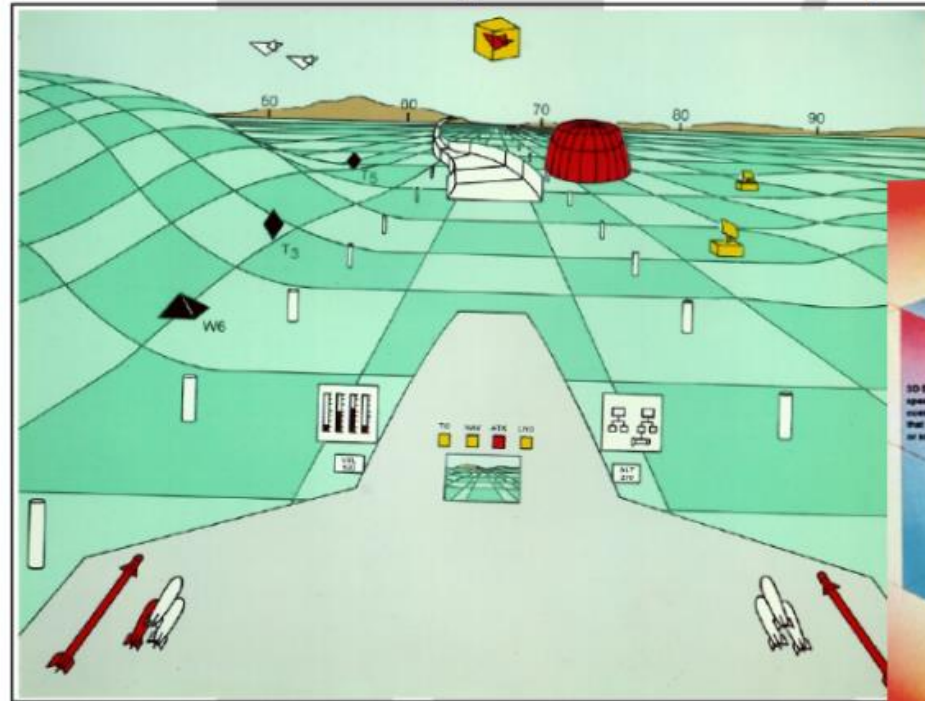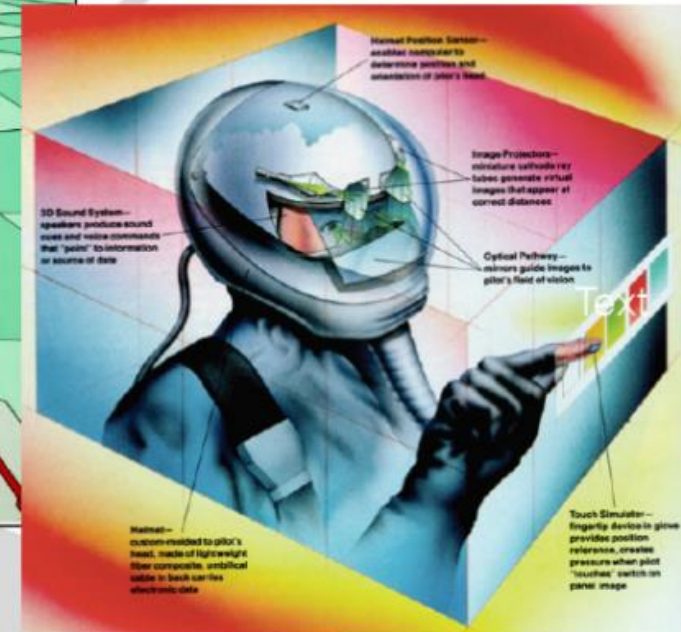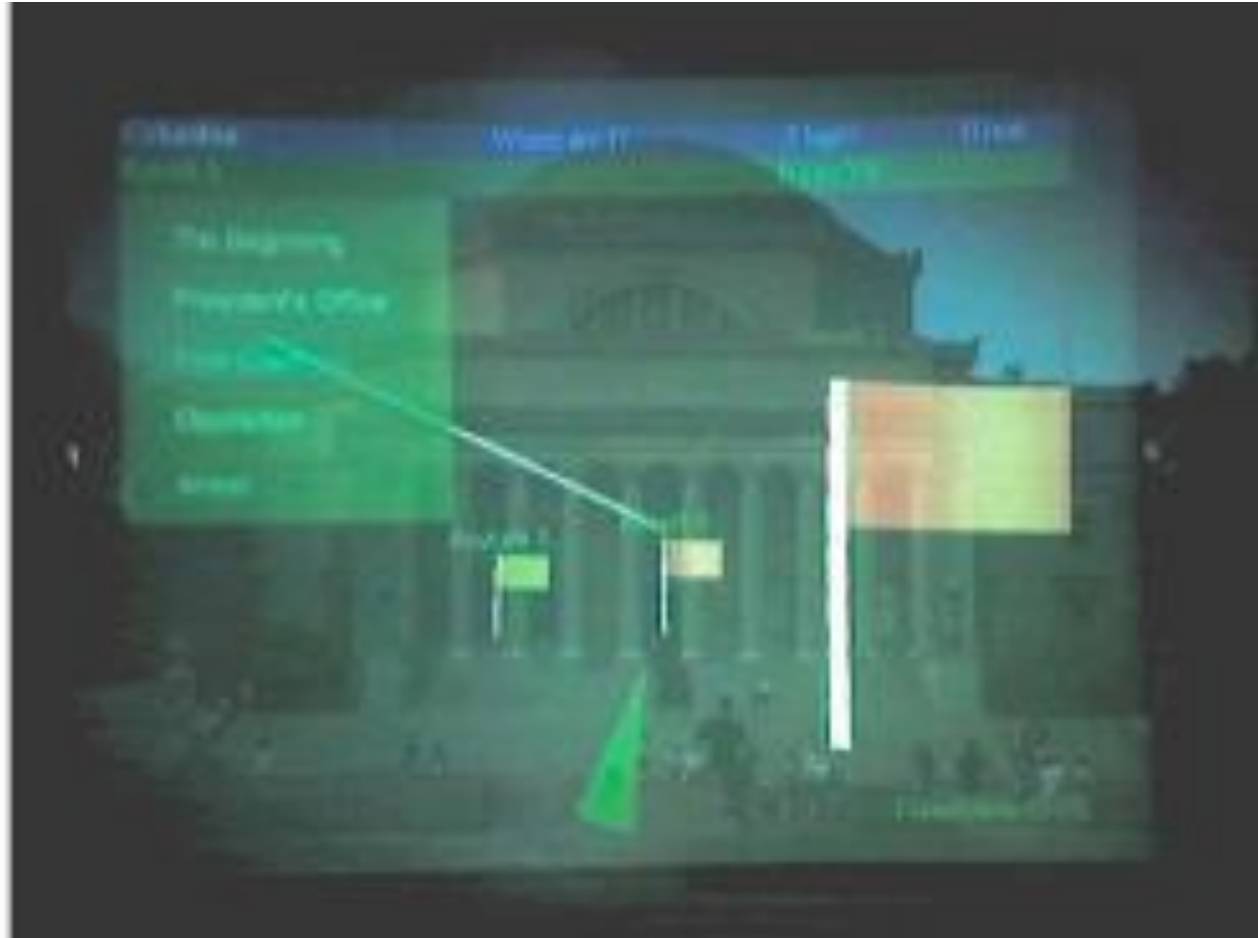
1968
"The Sword of Damocles" created by Ivan Sutherland first AR HMD system

1982
Thomas Furness develops Visually Coupled Airborne Systems Simulator

1987
"Virtual Reality" coined by Jaron Lanier of VPL Research Inc.

1988
Eyephone HMD for commercial use developed by VPL Research Inc.

1992
Brett Leonard's The Lawnmower Man

1993
Sega announce Sega VR prototype for Mega Drive console

2007
Google introduces Street View

2014
Facebook buy Oculus VR for US$2 billion from Palmer Luckey

1516
'Sala delle Prospettive' created by Baldassare Tommaso Peruzzi Villa Farnesina in Rome

1978
Andy Lippman's team at MIT create the Aspen Movie Map

1982
Steven Lisberger's TRON is released

1984
William Gibson publishes 'Neuromancer'

1985
Data Glove for commercial use developed by VPL Research Inc.

1988
Star Trek: The Next Generation introduces "the holodeck"

1995
CAVE Automatic Virtual Environment

1999
The Wachowski Brothers' The Matrix is released

2003
Linden Labs releases Second Life

2013
Nintendo files patent for VR 3D technology

2014
Google invest US$500 million into Magic Leap

2015...
To Infinity & Beyond

magic leap