

The History of Virtual Environments

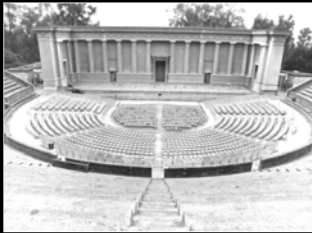
"Reality has always been too small
for human imagination"

Brenda Laurel, *Computers As Theatre*

Stoneage
early people: Cave painting



500 BC
the greeks: Theatre



1310
giotto: Painting Depth



1455
gutenberg: Printing Press



1455

gutenberg: Printing Press



1838

wheatstone: Stereoscope



1884

paul philippoteaux: Cyclorama



1895

lumiere and melles: Cinematographe



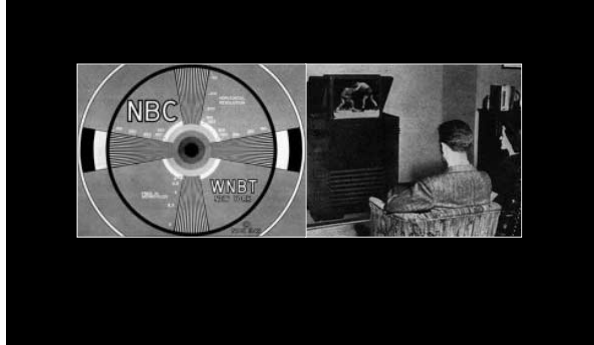
1920

edwin link: Flight Simulators



1941

NBC: Television



1952

fred waller: Cinerama



1960

morton heilig: Sensorama



1965

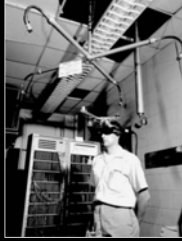
ivan sutherland: The Ultimate Display

- "We live in a physical world whose properties we have come to know well through long familiarity. We sense an involvement with this physical worlds which gives us the ability to predict its properties well. For example, we can predict where objects will fall, how well-known shapes look from other angles, and how much force is required to push objects against friction. We lack corresponding familiarity with the forces of charged particles, forces in non-uniform fields, the effects of nonprojective geometric transformations, and high-inertia, low-friction motion. A display connected to a digital computer gives us a chance to gain familiarity with concepts not realizable in the physical world. It is a looking glass into a mathematical wonderland."

"The Ultimate Display", 1965

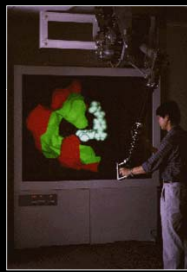
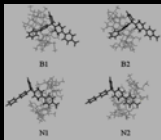
1965

ivan sutherland: The Ultimate Display



1967

fred brooks: Force Feedback



1972

atari: The Arcade



1980s
DARPA: SIMNET



1985
UNC: Architectural Walkthrough

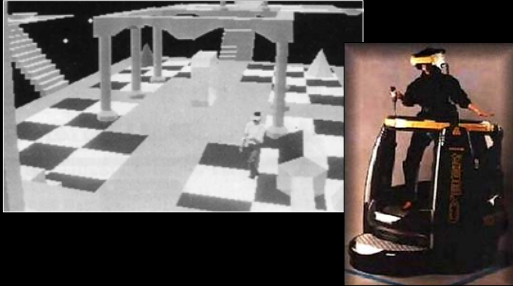


1986
NASA: VIVED



1991

w industries: **Virtuality**



1993

id and cyan: **Popular 3D Games**



Doom



Myst
