



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai



DEPARTMENT OF INFORMATION TECHNOLOGY

16IT AUGMENTED REALITY AND VIRTUAL REALITY

III YEAR – V SEM

UNIT 3 – INTRODUCTION TO VIRTUAL REALITY

TOPIC 1 – Fundamental Concept and Components



Introducing virtual REALITY



PPT SAGAR SUVA





Virtual Environment Introduction

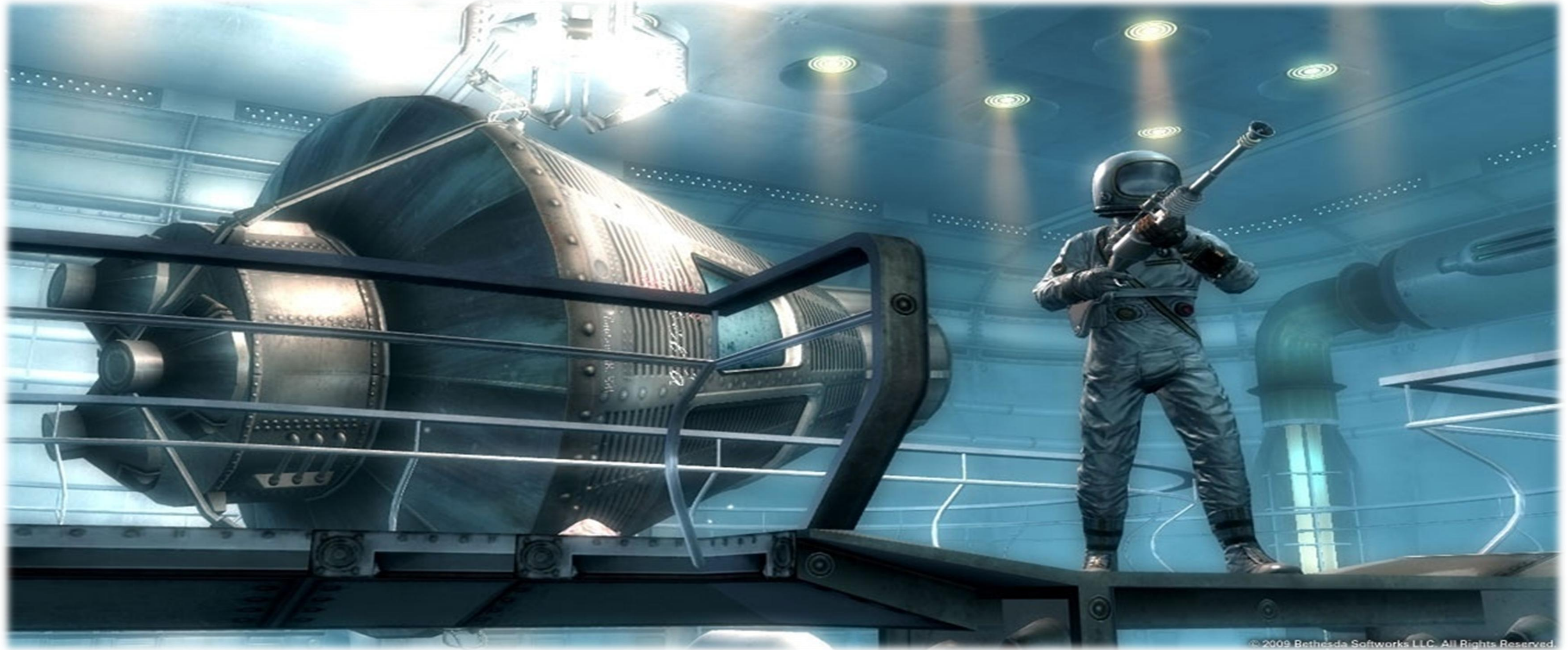


- A computer generated world with which user can interact is called Virtual Environment.
- This interaction can vary from looking around to interactively modifying the world.





VIRTUAL REALITY INTRODUCTION





Definition



- A computer generated immersive or wide field multi sensory information which tracks user In real time.





Types of Virtual reality



- There are following types of virtual reality.

Immersive

Window on world

TelePresence

Mixed Reality



Immersive virtuAL REALITY



The Immersive Virtual Reality System completely involve the users personal viewpoint in the virtual world Like a person experiencing cave scene





HMD Head Mounted Display



This is a helmet or face mask that holds the visual and auditory displays.

In immersive system a large projection displays are used to create a virtual background such as room or cave.





Window on world virtual REALITY



Some systems uses conventional computer monitor to display visual world. This sometimes called Desktop Virtual reality or Window on World (WoW)





Tele Presence **VIRTUAL REALITY**

- Telepresence is variation to visualize complete computer generated world.
- This is a technology which links the remote sensors with the senses of human operator in real world.
- Fire fighters uses remote controlled vehicles to operate some dangerous conditions. This vehicles are equipped with Telepresence systems.

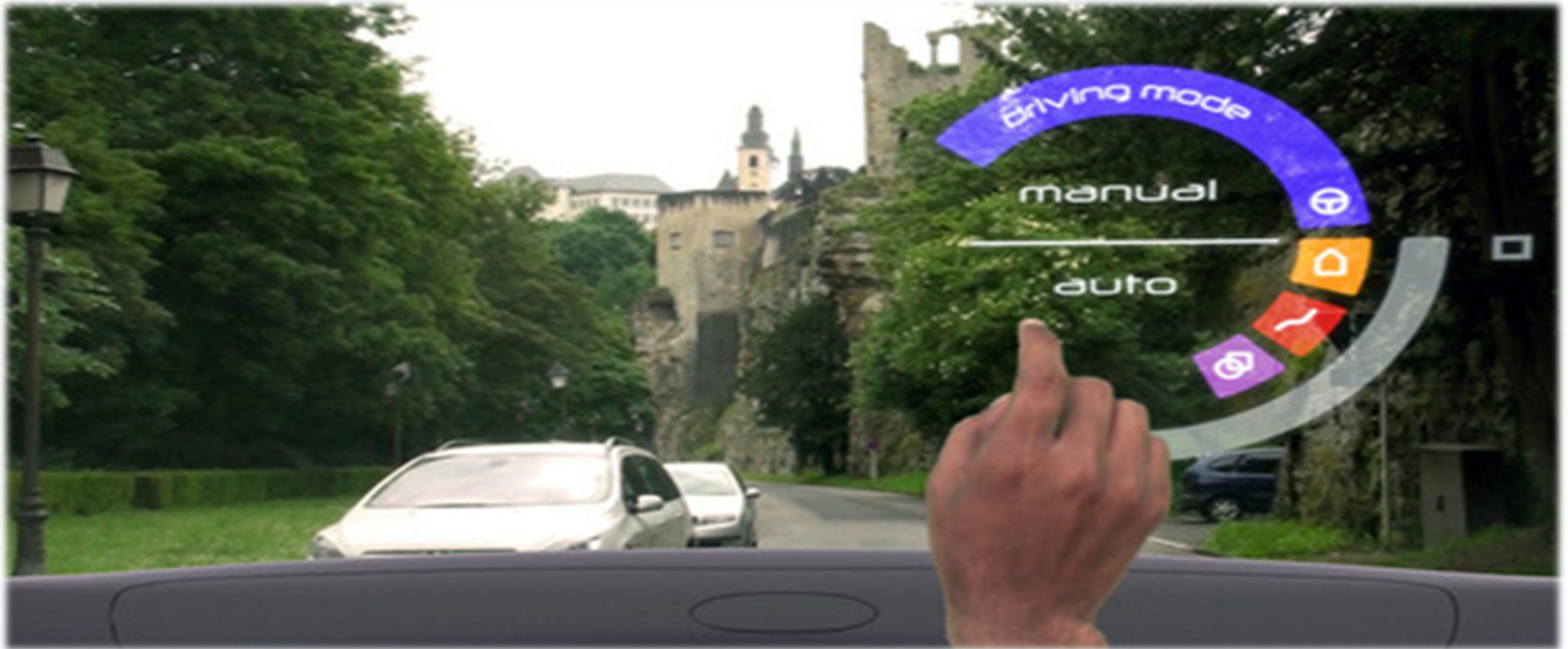




Mixed VIRTUAL REALITY



- Merging the Telepresence and Virtual reality systems gives the mixed virtual reality or seamless simulation.
- A fighter pilot can see computer generated maps and scenes data displays in there fancy HMD that is Helmet visor or cockpit displays.
- In this type of virtual reality user can see, Hear virtual world and can operate that world by using Telepresence.





Virtual Reality Hardware





Virtual Reality Hardware



- There are multiple specialized types of Hardware devices that has been developed or used for virtual reality applications.

VR Hardware

- Image Generators
- Manipulation & control devices
- Stereo Vision

VR Hardware

Image
Generator

Manipulation
& control
device

Stereo
Vision

Head
Mounted
Displays



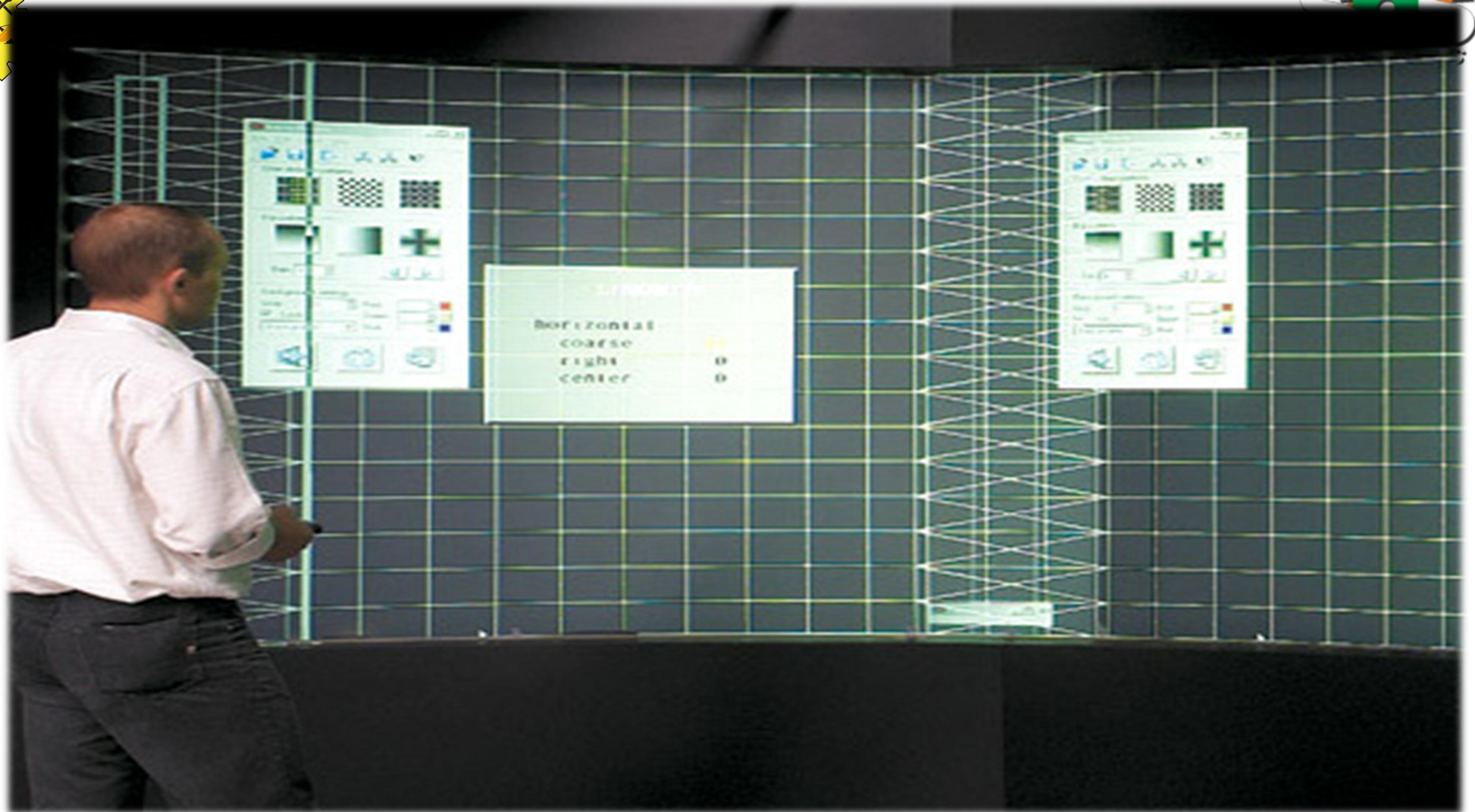
Image Generators

One of the most time consuming task in Virtual Reality is generation of images.

Fast computer graphics opens a large range of applications aside from virtual reality.

So there is a market demand for graphic acceleration for long while.

There are number of vendors selling image generator cards for PC level machines which ranges from \$2000 to \$10000





Manipulation & control devices

One key element for interaction to the virtual world that is tracking the position of real world objects such as head or hand.

The conventional control devices are mouse, trackball, or joystick

Some common used VR control device is Instrumented Glove.

The use of Glove is to manipulate objects in the computer by using inbuilt sensors which fitted on fingers for tracking.





Stereo Vision

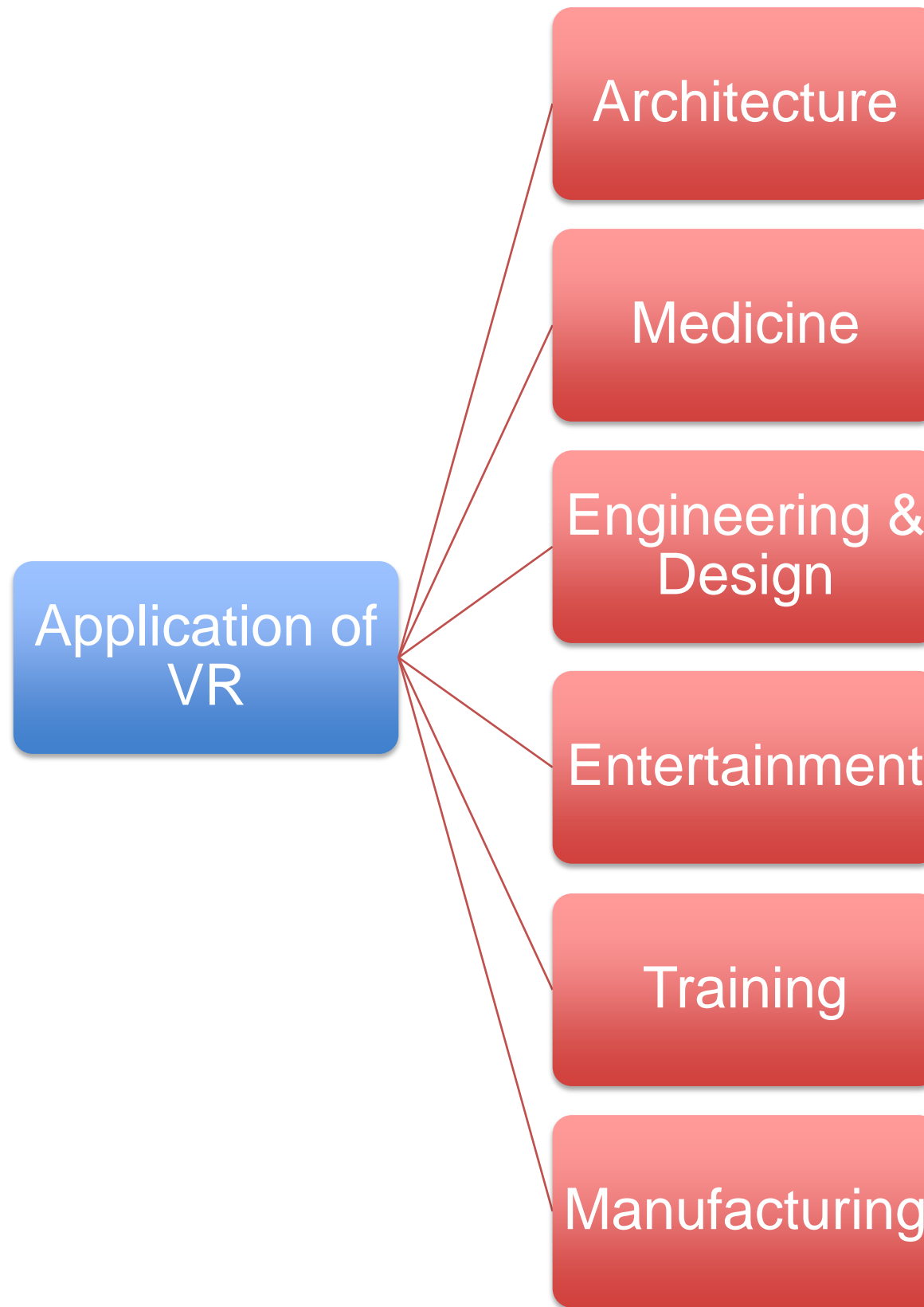
Stereo vision is also included in virtual reality system.

This is accomplished by creating two different images of the world one for each eye.

The images can be projected through differently polarized filters. These filters are placed in front of our eyes.

When these images are shown in rapid succession, the brain fuses these two images into a single image and can get a 3D experience.



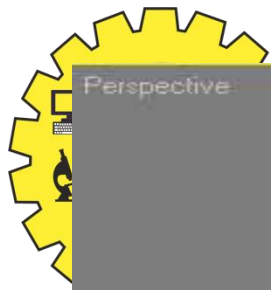




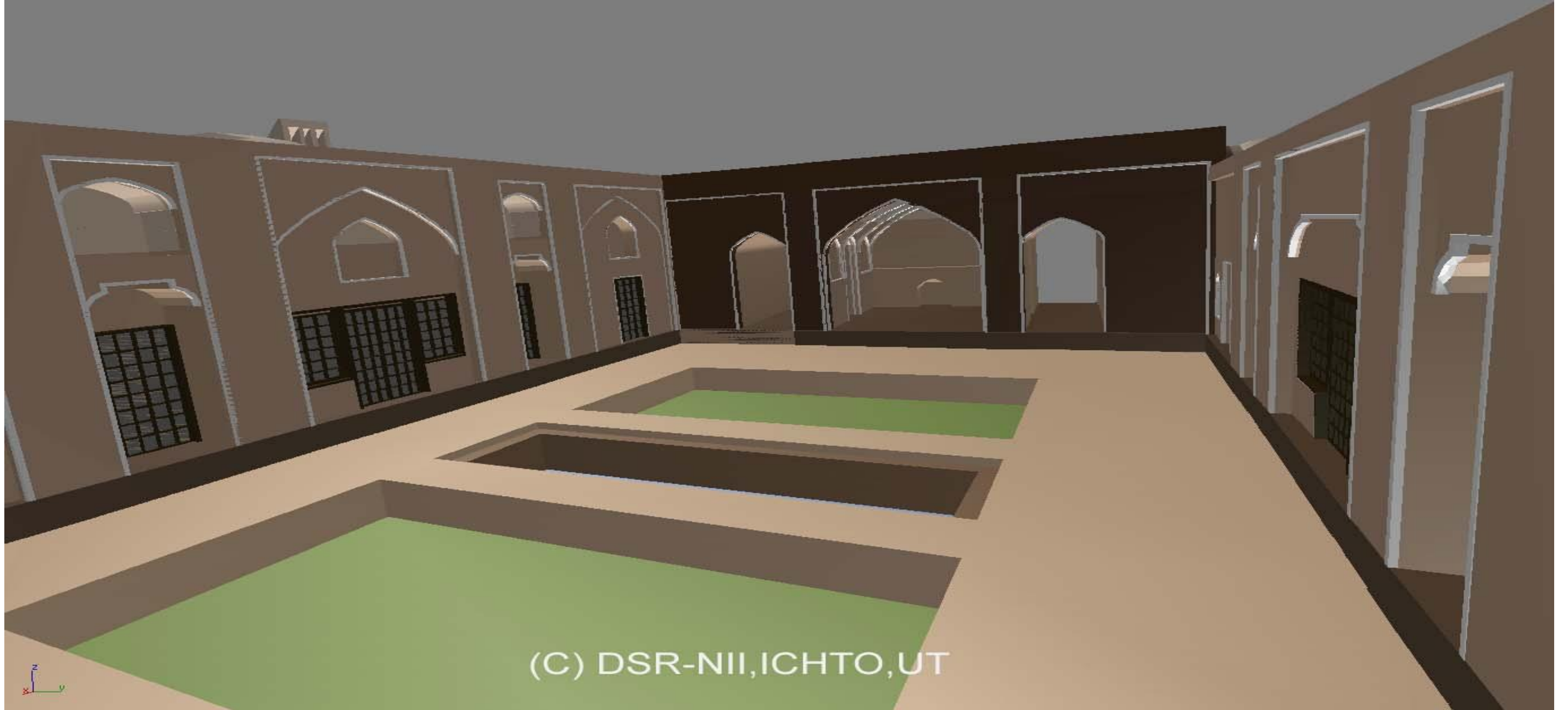
Architecture **Designing**



For many years virtual reality has been used to establish models of architectural models and buildings before construction begins. It can also be used to reconstruct building which is collapsed or damaged or to determine how this happened & the steps needed prevent the situation in the future.



Perspective



(C) DSR-NII, ICHTO, UT





Medical Field



The medical field uses virtual reality in many ways.

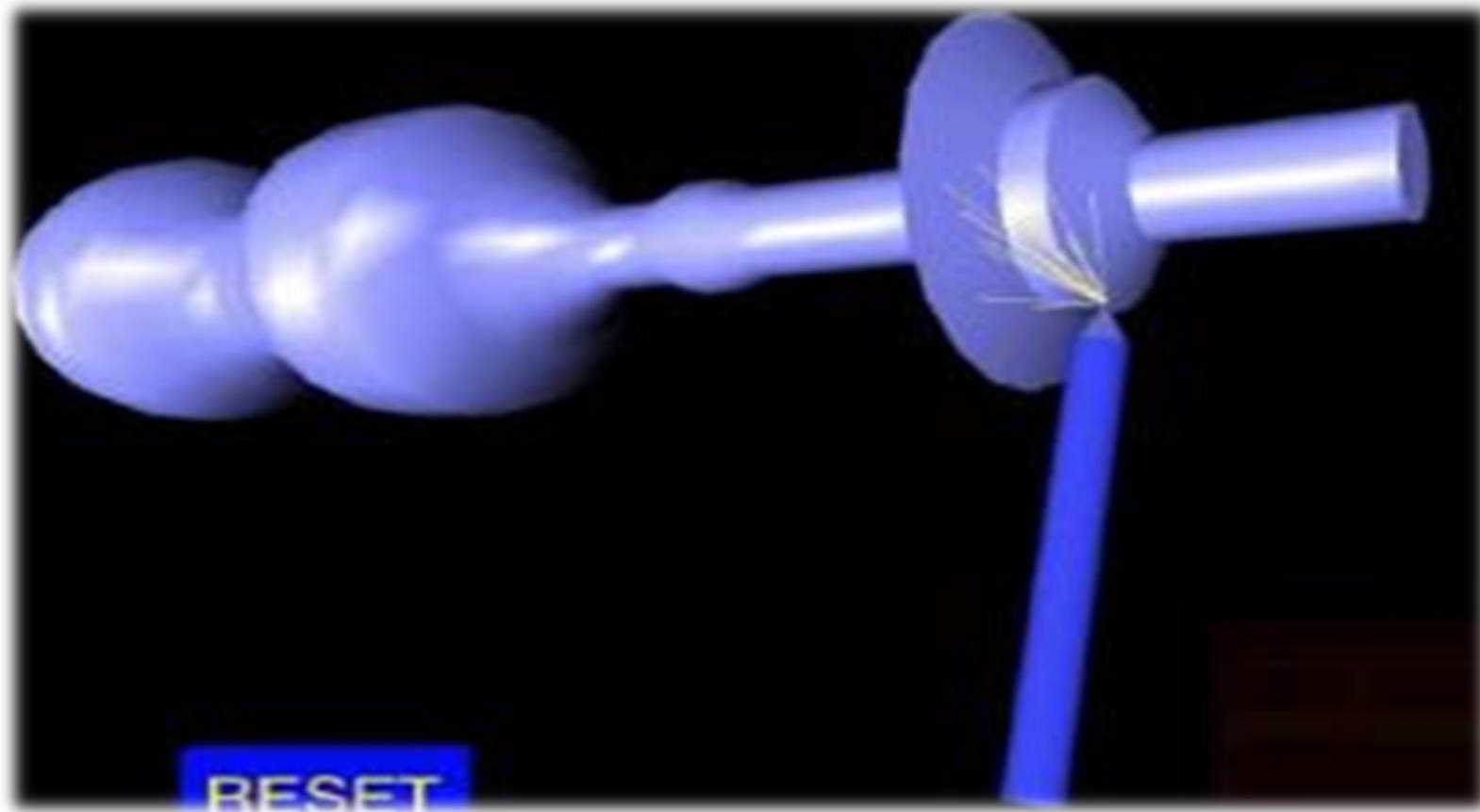
The most common implementation of the technology is to combine images provided by other scans and merge them to present the details, using medical imaging technology

This helps doctors diagnose problems without performing surgery.





Engineering & designing **Field**

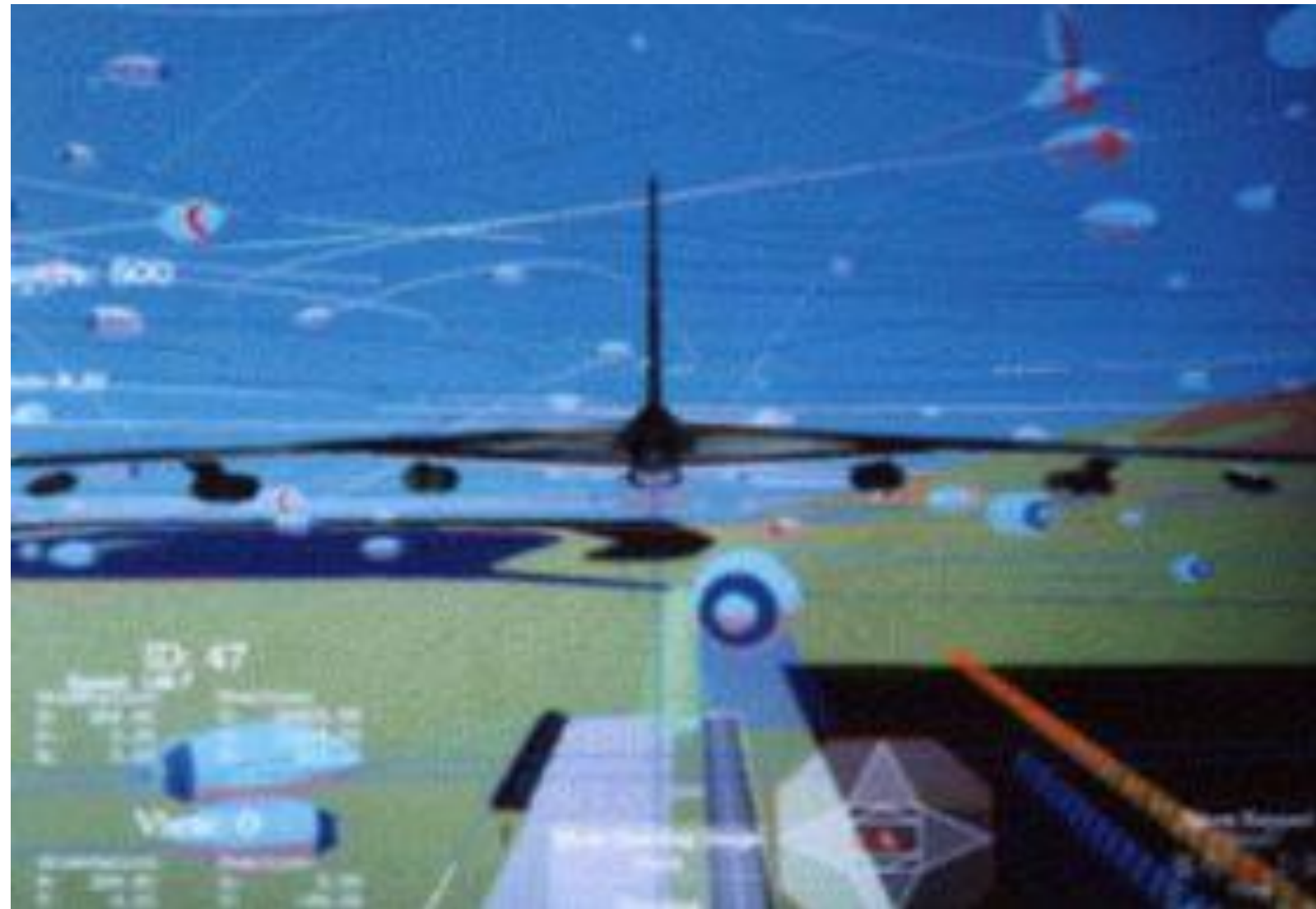


This lathe is used to train apprentices.

Unlimited free material and no clean up!



Entertainment Field



definition Televisions
VR is used for highly
resolute output
Also for motion games



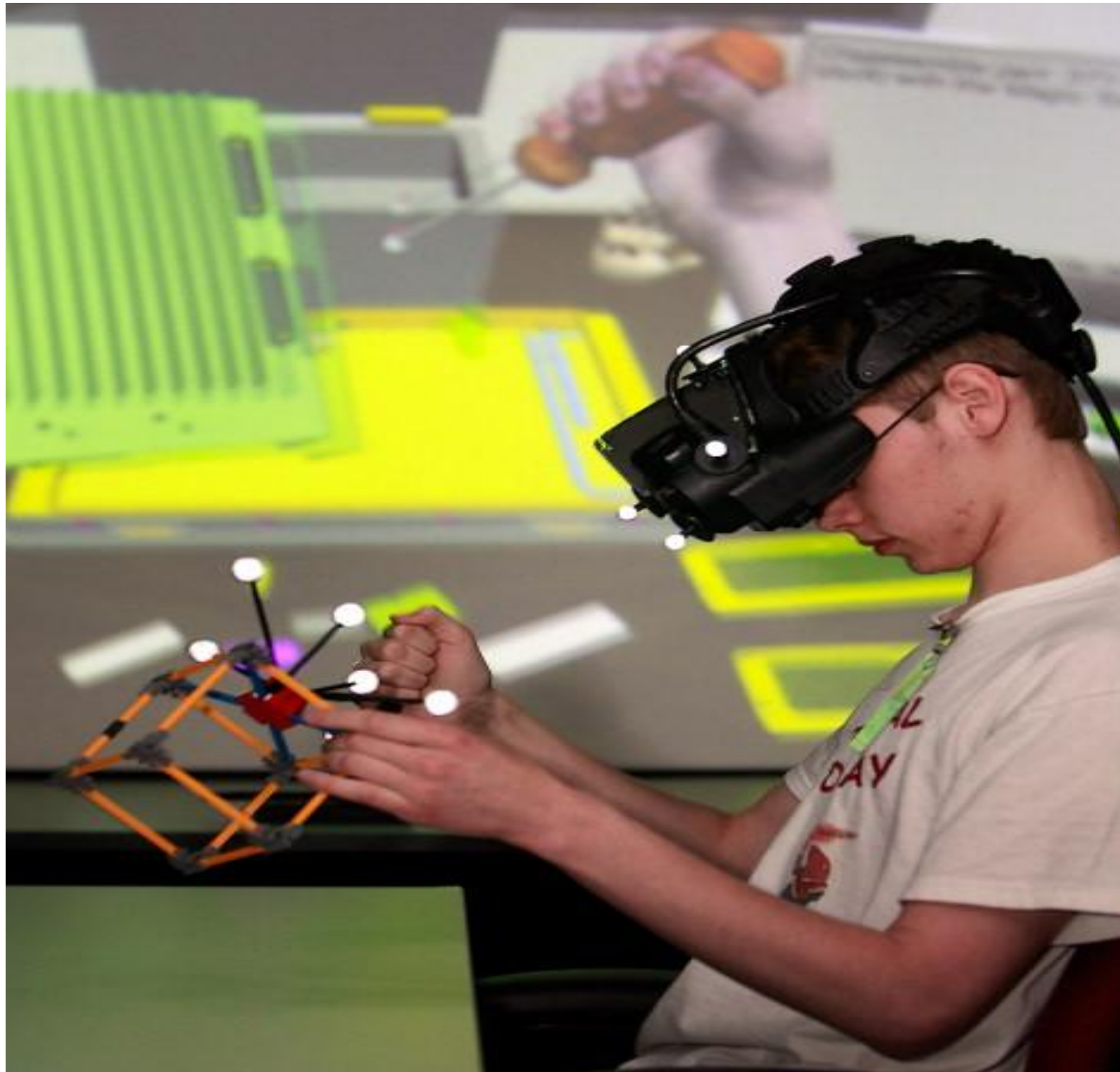
Training Field



United states uses VR as flight simulator to train pilots. With VR training huge saving of fuel, electricity, wear & tear could be effected.



Manufacturing **Field**



United states uses VR as flight simulator to train pilots.

With VR training huge saving of fuel, electricity, wear & tear could be effected.

