

# Accomplishments in Virtual Reality

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# Accomplishments in Virtual Reality for Scientific Visualisation

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# Outline

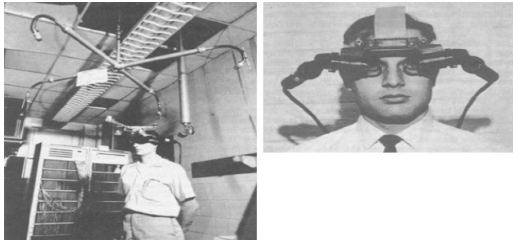
- Sutherland's Vision
- Three defining moments
- Outstanding problem: 3D interaction

# Sutherland's Vision (1965)

- Display as a window into a *virtual world*
- The picture in the window *looks real*
- Computer maintains world model in *real time*
- User *directly manipulates* virtual objects
- Manipulated objects move *realistically*
- Virtual world also *feels real, sounds real*
- Modern lingo: *presence in a synthesised multi sensory environment*
- Technology keywords: *display, tracking, interaction*

# Sutherland's Vision (1965) TU/e

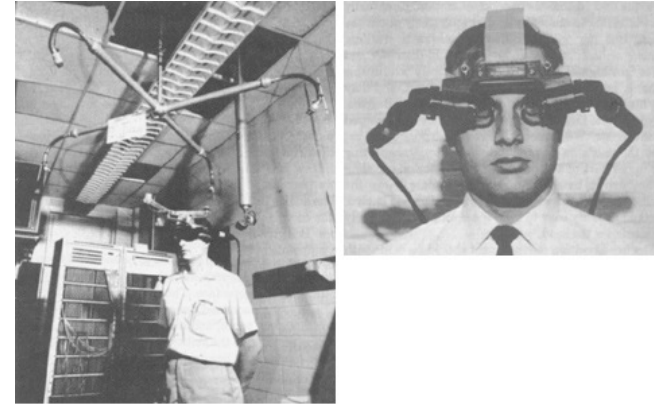
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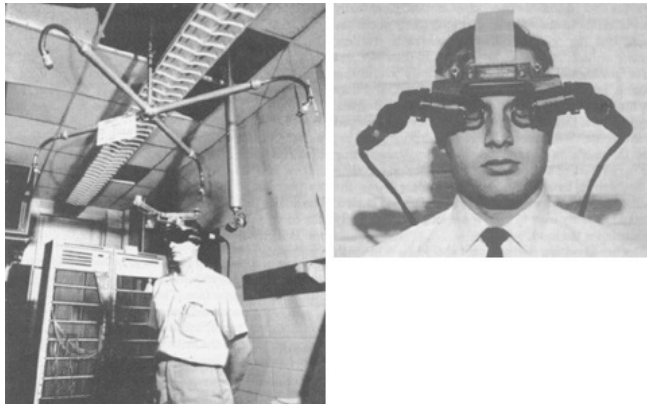
# The Sword of Damocles TU/e



Sutherland, I.E. (1968)  
A Head -Mounted Three-Dimensional Display  
AFIPS Conference Proceedings,  
Vol. 33, Part I, 1968, pp. 757-764.

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# Scientific Visualization TU/e

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# Some Defining Moments

- Projects:
  - Grope (1971): "feel the dock"
  - VCASS (1980): "advanced flight simulator"
  - Walkthrough (1985): "look around the 3D space"
  - Virtual Windtunnel (1990): "analyse the flow field"
- Technology:
  - VPL Dataglove and Eyephone HMD (1987)
  - Fakespace BOOM (1985)
  - CAVE (1992)

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# Walkthrough

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# Lessons Walkthrough

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# Walkthrough Follow-Ups

# Virtual Windtunnel

# Lessons Virtual Windtunnel

# Lessons Virtual Windtunnel

## 3D Interaction

## 6DOF Controllers / Devices

- Dataglove
- Wand
- Nunchuck
- Wii
- ...

## Problems

## Three Examples

- Cubic Mouse (2000)
- Nano-manipulator
- Tangible Printed Props (2008)

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Cubic Mouse

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Nanomanipulator

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Printed Props

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