

Towards the Holodeck

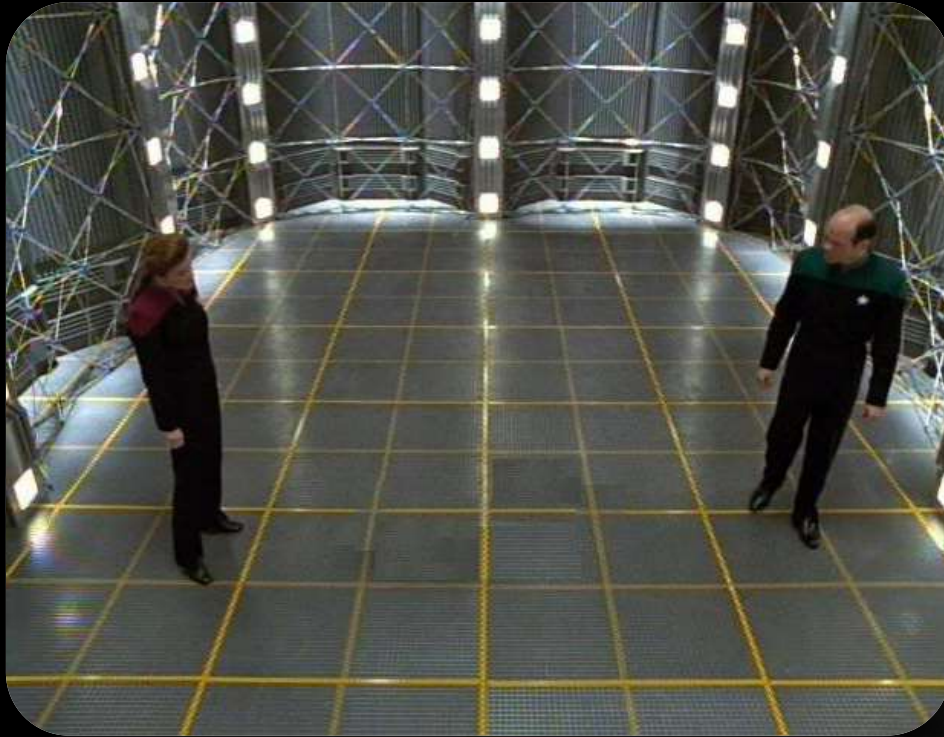
Fully Immersive Virtual Reality Visualisation
of Scientific and Engineering Data



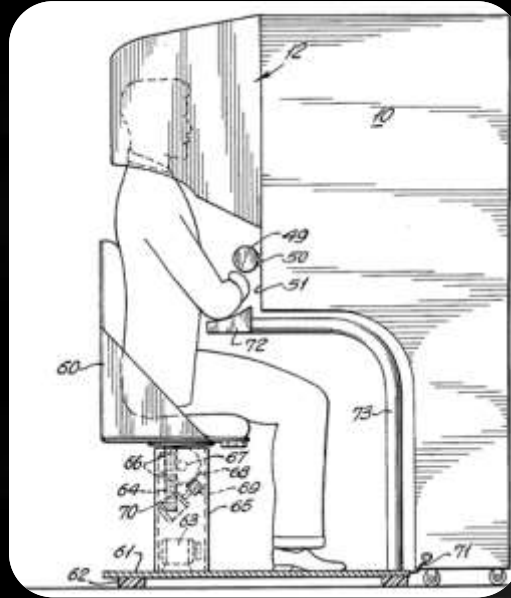
Stefan Marks
Javier E. Estevez
Andy M. Connor



The Gold-Standard



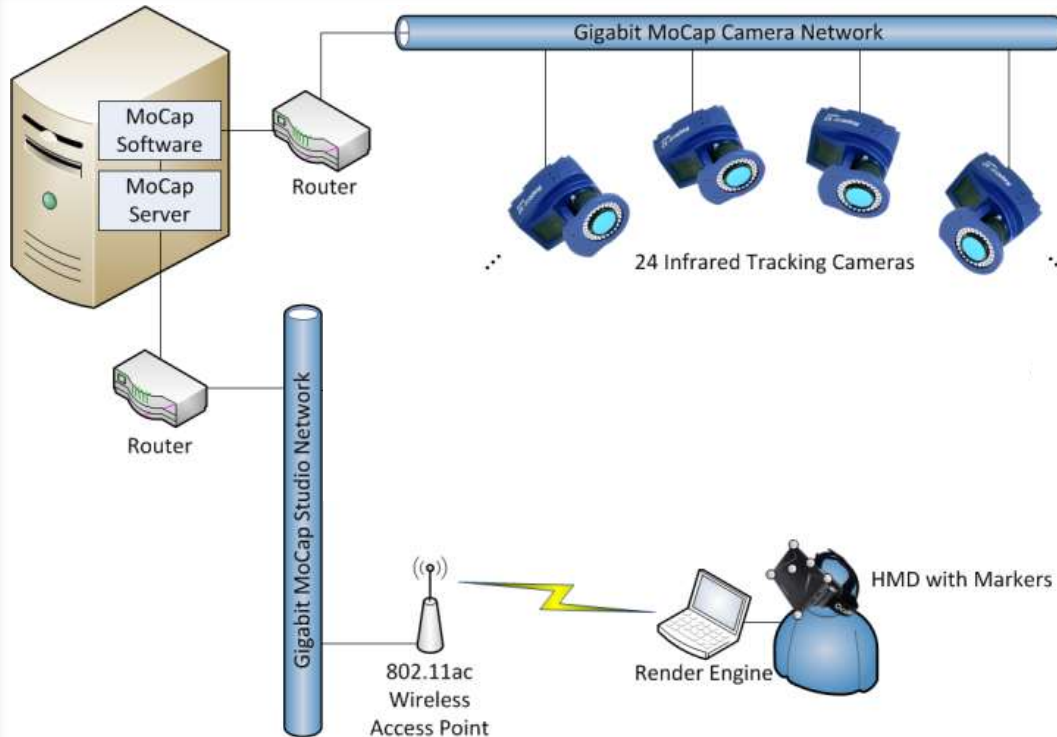
The Beginnings



The Current State



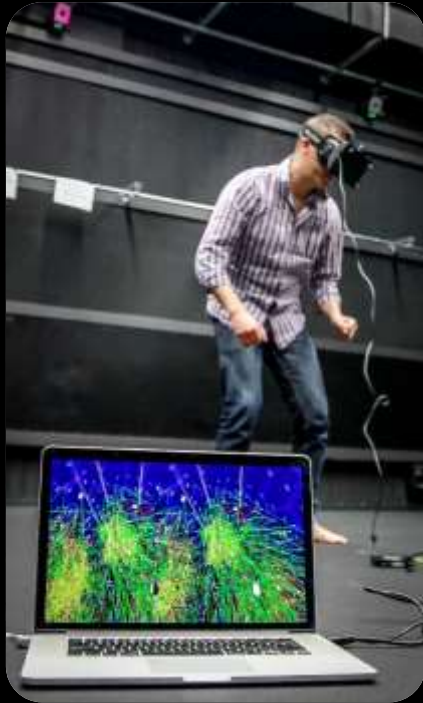
System Architecture vo.1



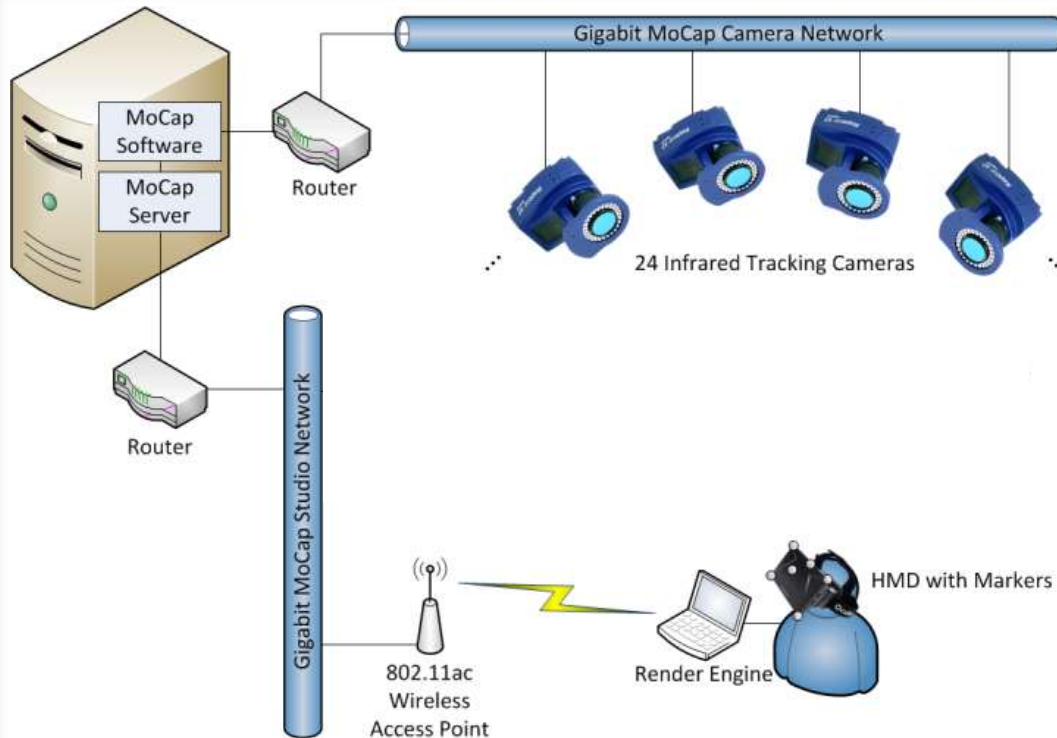
- Idea not new
e.g., CHIL,
Lockheed Martin



First Steps

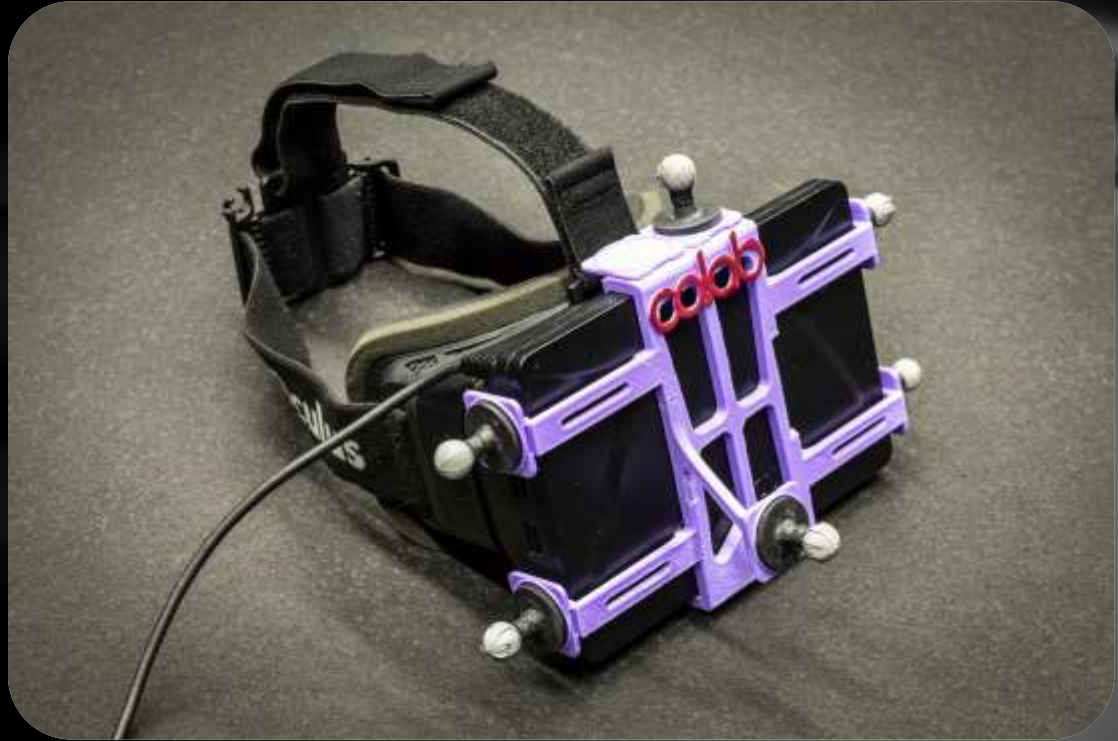


System Architecture vo.2



Hardware

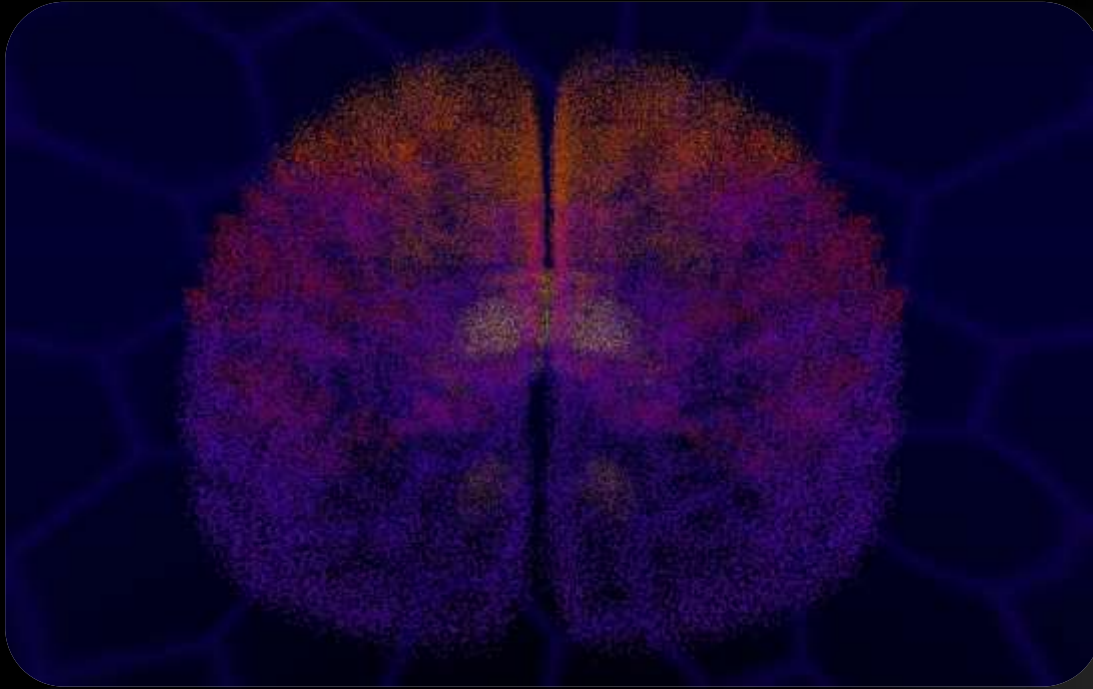
- Oculus Rift + Marker-Template
- Wireless HDMI
- Battery Pack



Hardware

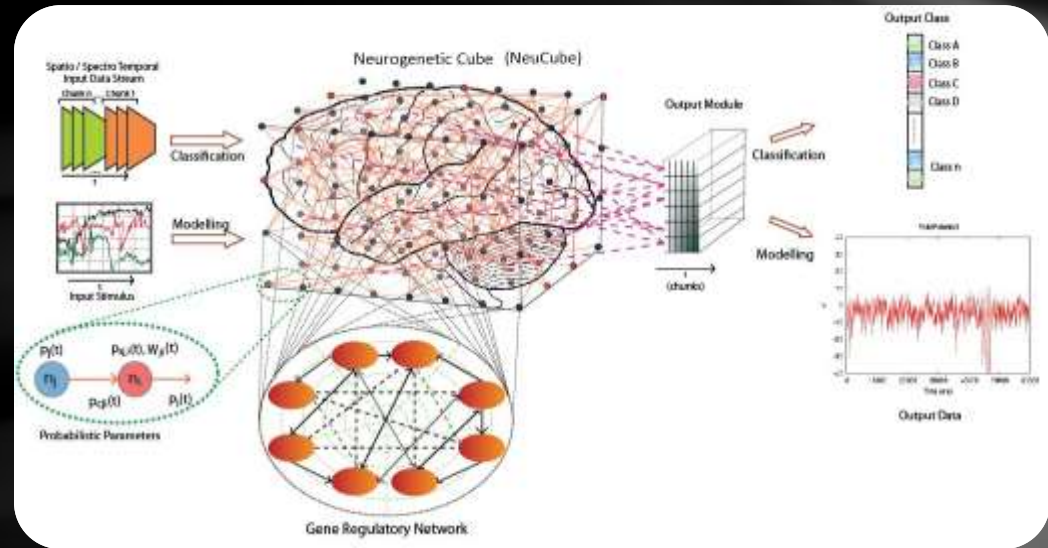


Usecase 1: KEDRI



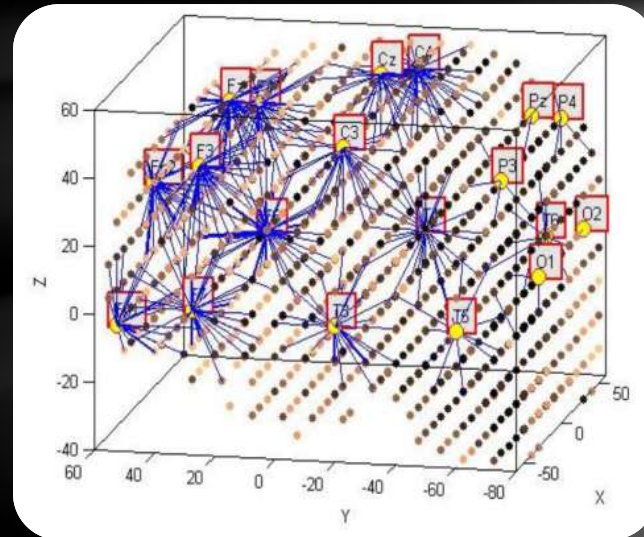
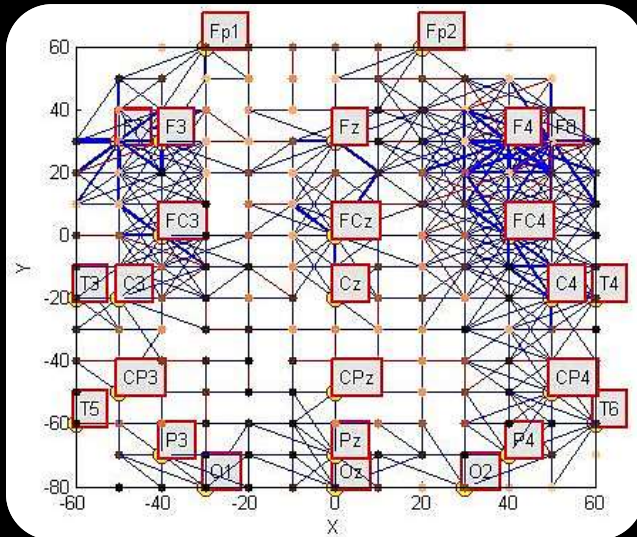
NeuCube

- Spiking Neural Network
- ~1400 Neurons/
4000 Connections
...and increasing
- Used for Classification
of EEG data,
fMRI data,
etc.



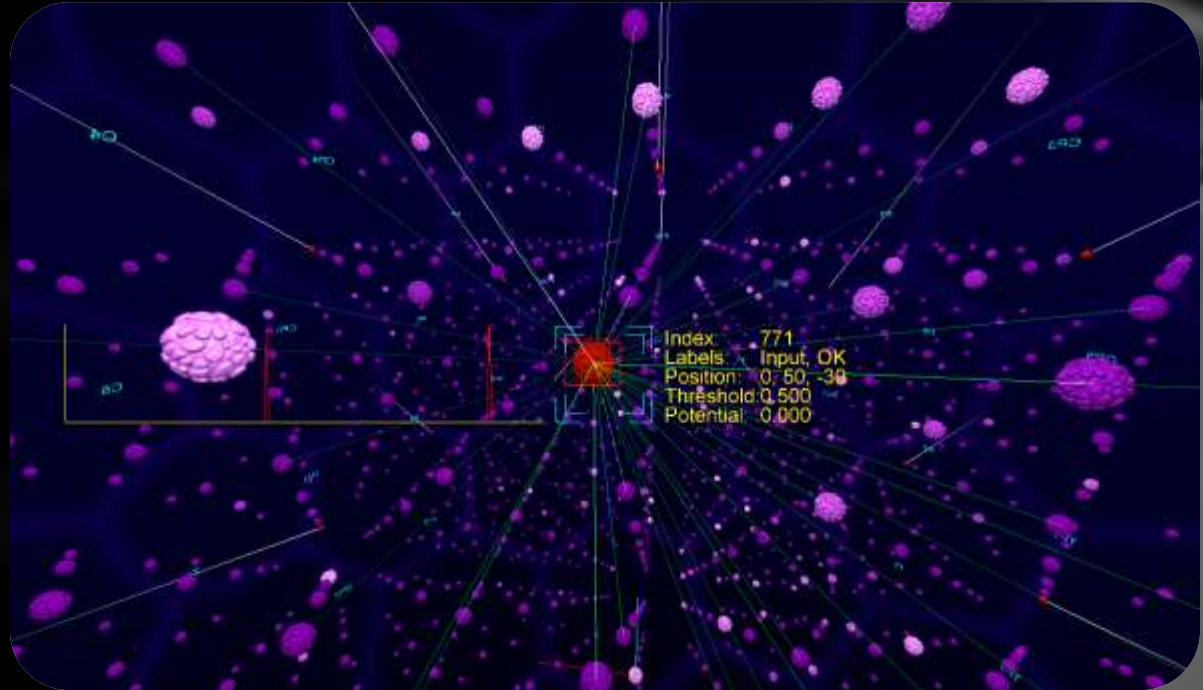
Problem

- Current Visualisation: In MatLab, No interaction



Service

- 3D
- “Walk Through”
- Interactive
 - Neuron detail
 - Time control
 - Comparison
 - ...



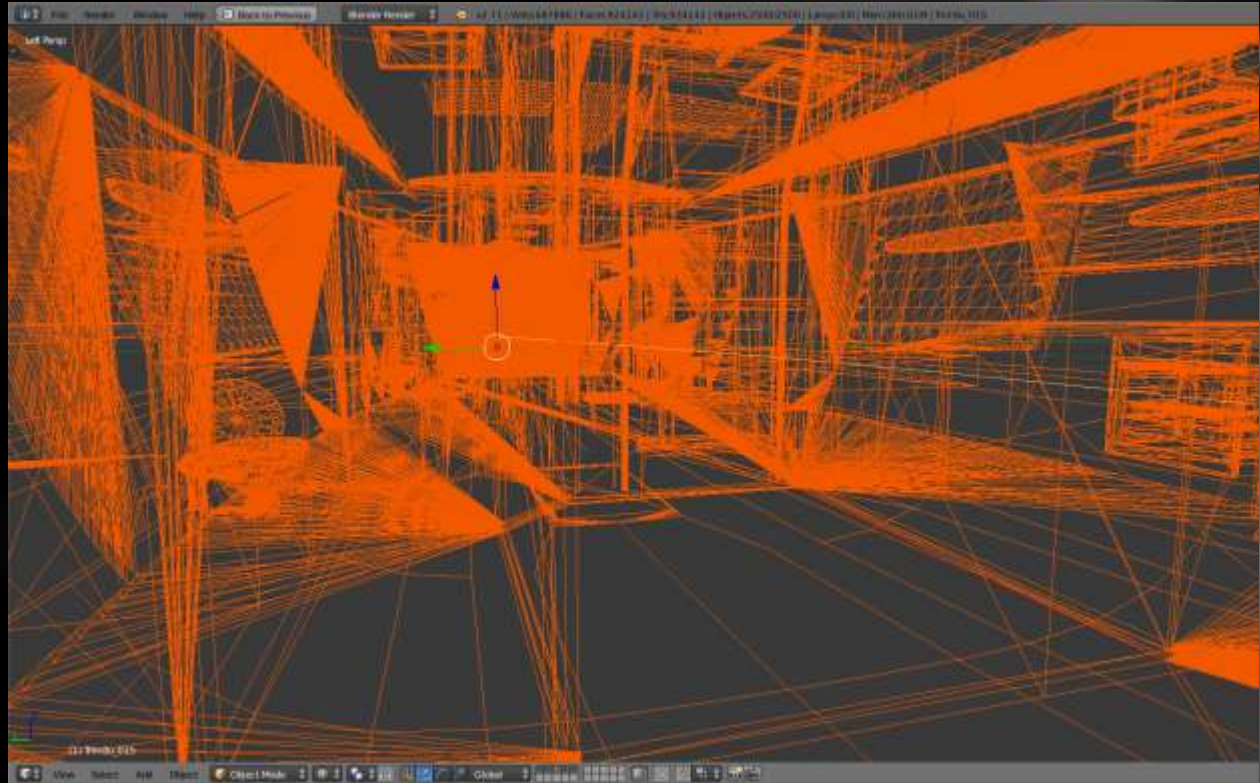
Usecase 2: Stimson Yachts



- “Transfer-Pipeline” for CAD Model into the VR engine
- Rhino3D > OBJ > Blender > FBX > Unity 3D
- Visual inspection of design before building
- Commercial potential: showcasing to customers

Problems

- CAD
vs.
Game Engine
- 670k Vertices
- 925k Tris
(w/o Rigging)
- Materials
- Logic

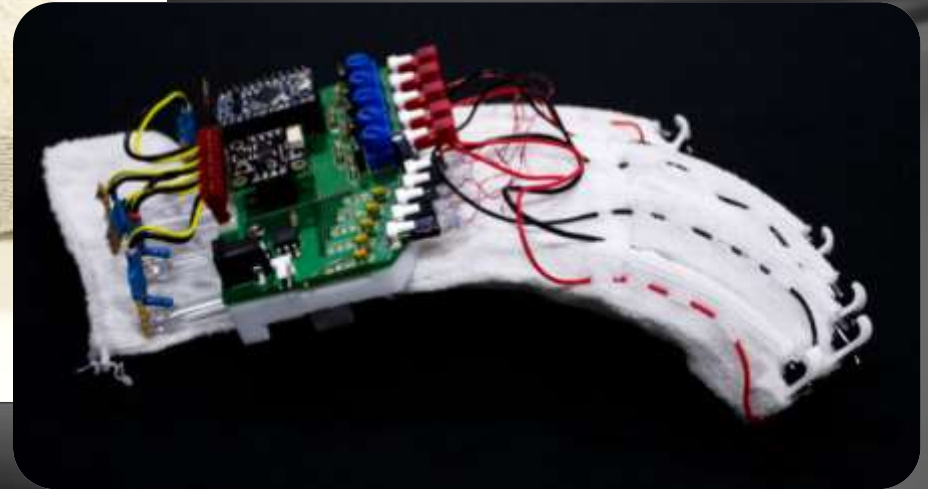
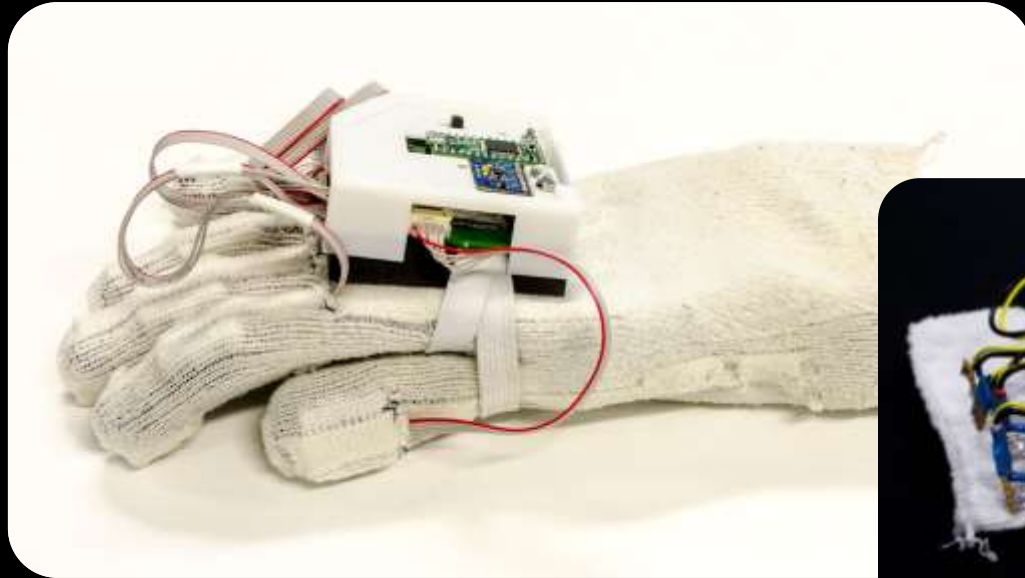


Future Work

- More Hardware
- More Usecases
 - Commercial
 - Artistic
- More Engines
 - Unreal, Blender,...
 - Realtime Raytracing



Haptic Glove



Realtime Raytracing



Questions, Watson?

