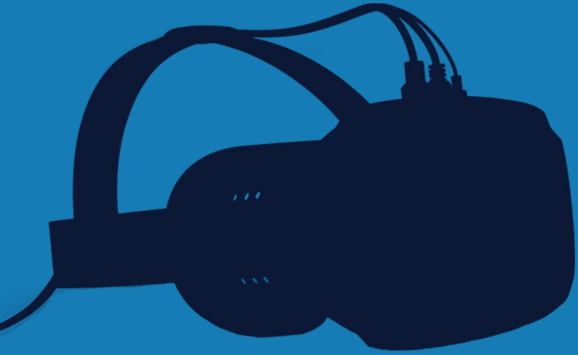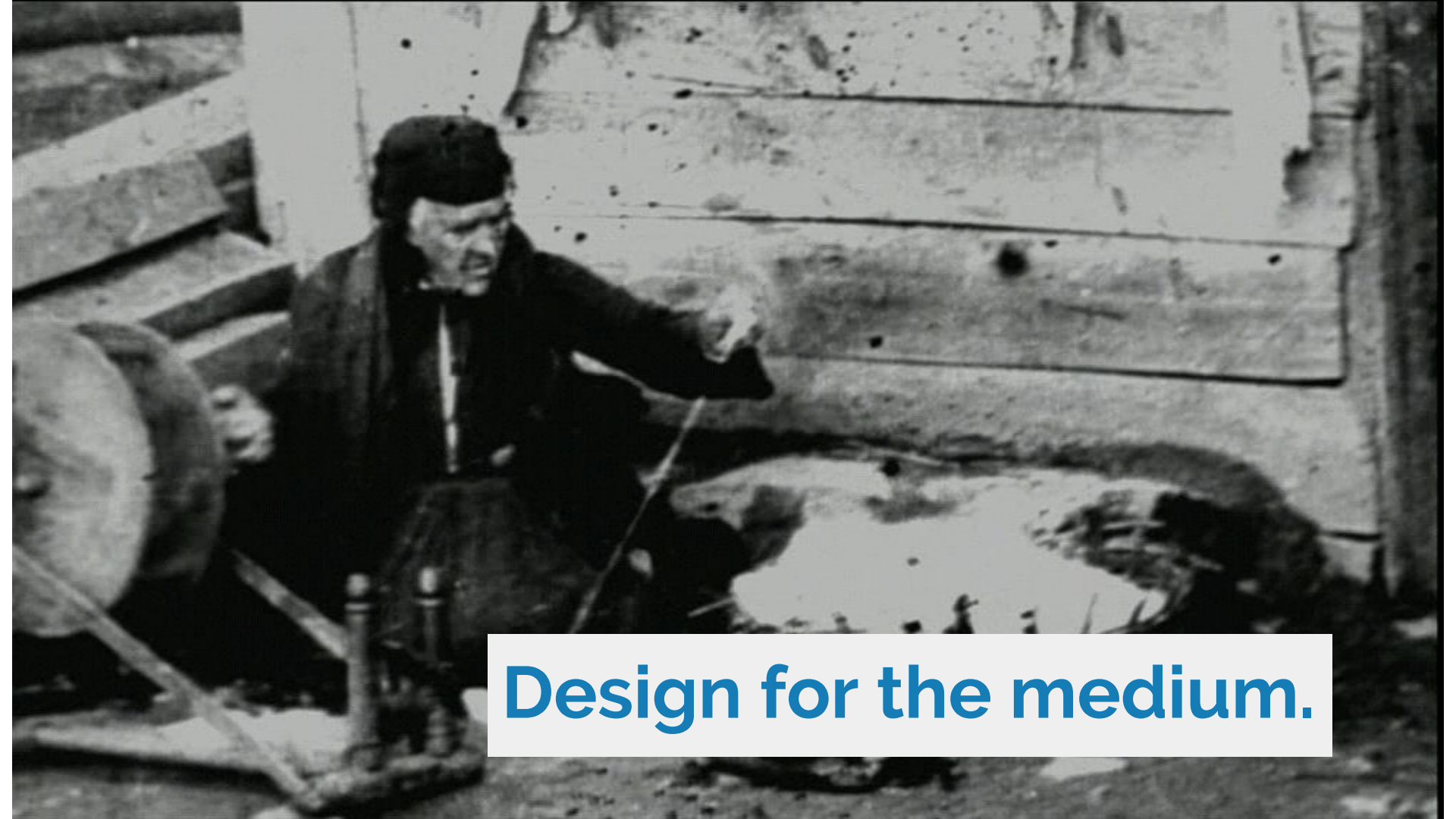Lec1

Designing Virtual Environments

Why is VR design so important?

Design for the medium.
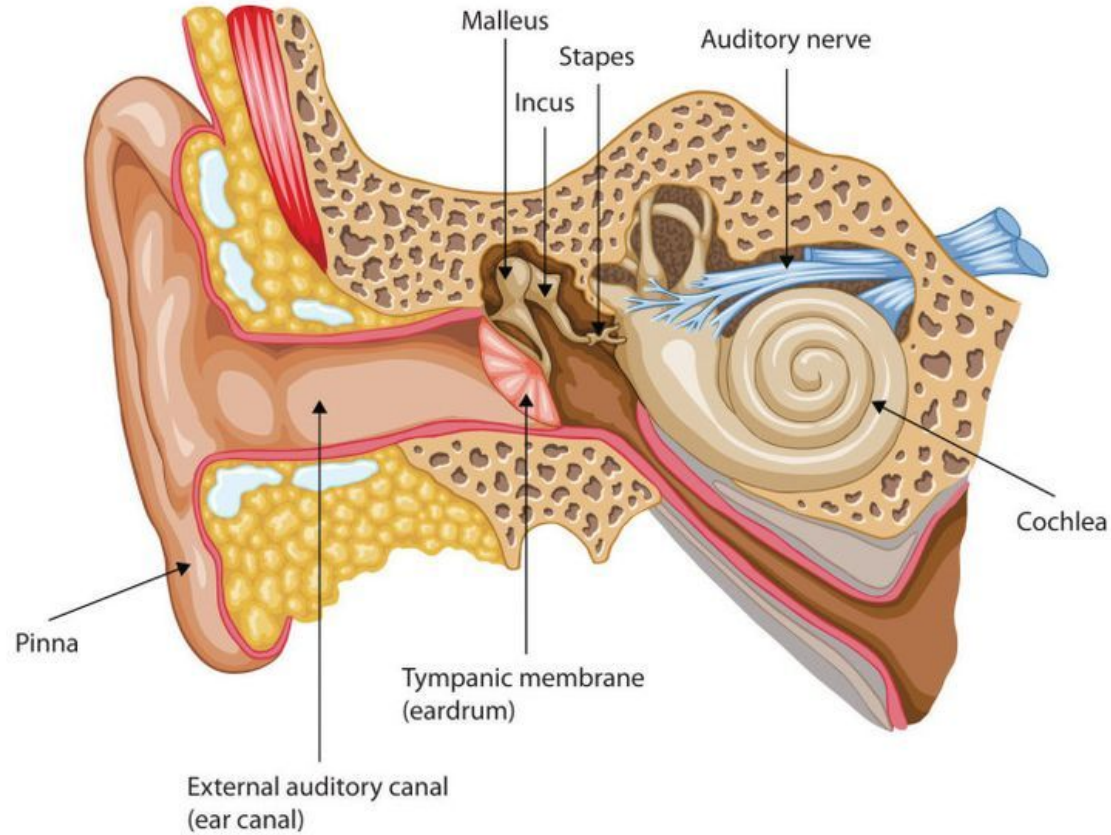
Prevent Sickness

Suspend Disbelief

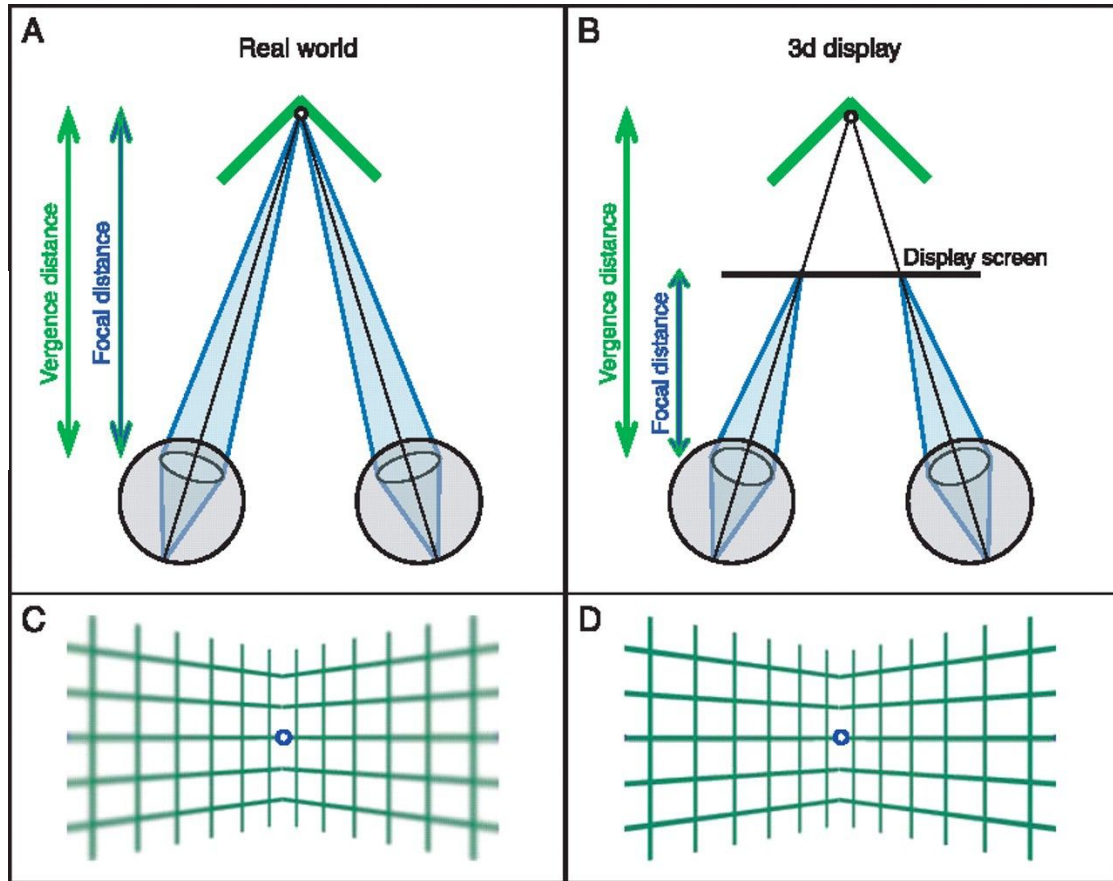# Increase Immersion

1) Prevent sickness.

Visual Vestibular Mismatch

Malleus

Stapes

Auditory nerve

Incus

Pinna

Tympanic membrane
(eardrum)

Cochlea

External auditory canal
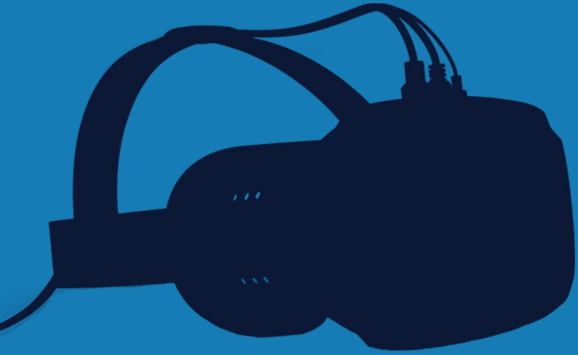(ear canal)

Vergence accommodation conflict

THE OBSCURE NEUROSCIENCE PROBLEM THAT'S PLAGUING VR

Designing around it

Don't accelerate the user. Never move the camera without user consent. Minimize jarring movement. Discourage continuous rotation. Add lots of depth cues. Don't put things close to the user's face. Avoid head-locked HUDs. Meet frame-rate benchmarks. Keep the horizon steady.

2). Suspend Disbelief.

Own your environment.

Make them feel **safe**.

Own your environment.

Make them feel **comfortable**.

Own your environment.

Make them **trust you**.

Own your environment.

Not every setup has 360 degree tracking

Set up your environment to afford good solid tracking.

Don't put interactible things behind you.

Ceiling height interaction! Some setups have low ceilings.

Prevent continuous 360 rotation (don't get your users tangled up)
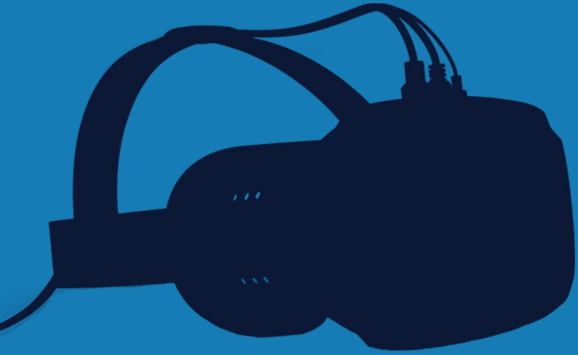
Make them **trust you**.

Own your environment.

Make them feel **interested**!

Consider your application.

An environment for a productivity app looks different from that of a videogame.
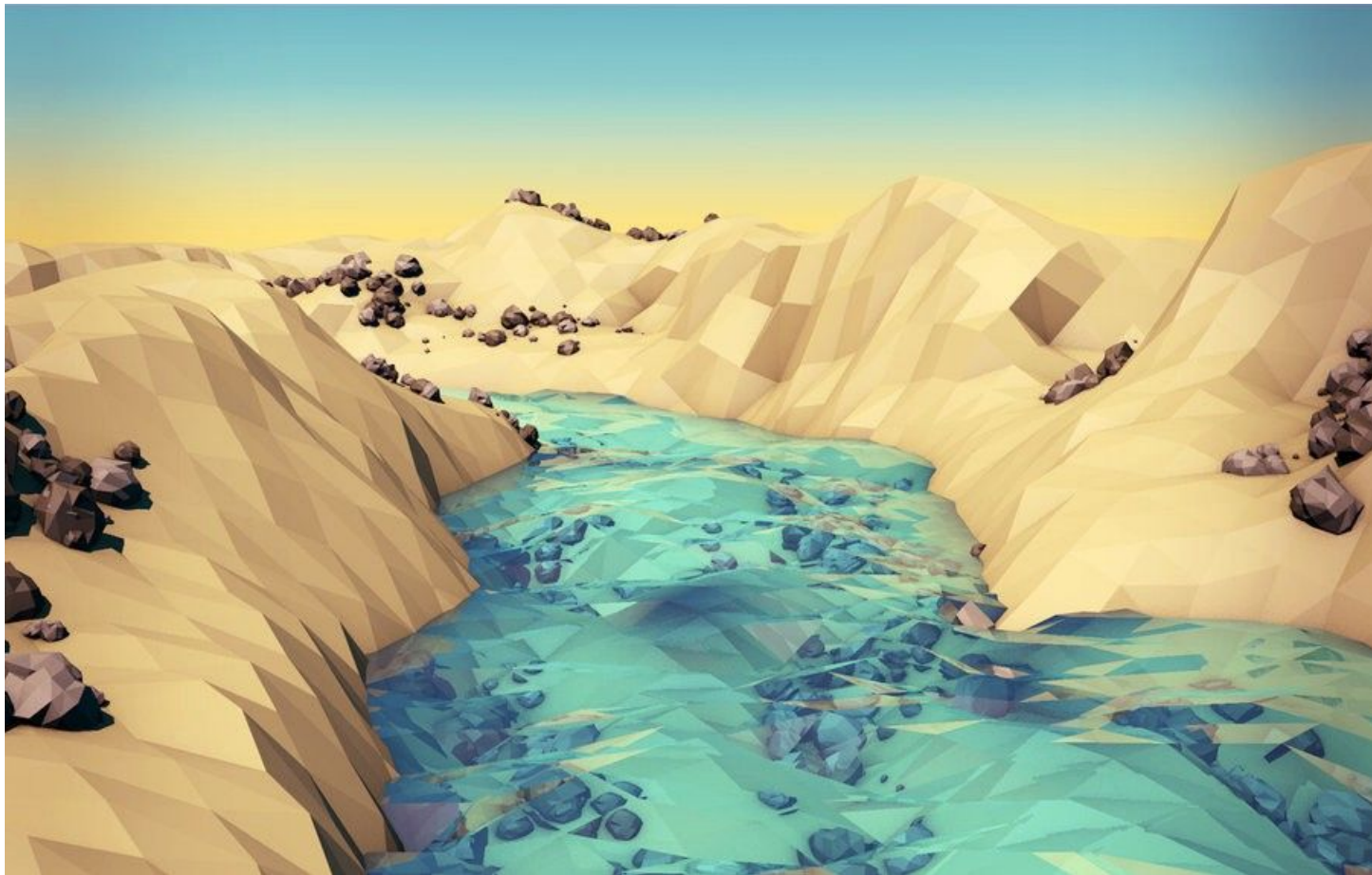
3). Increase Immersion.
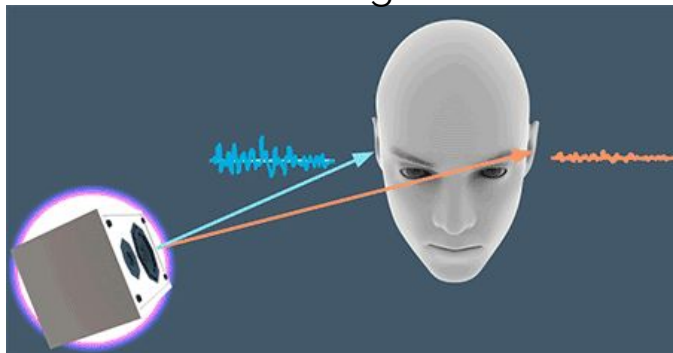
More realistic isn't always more believable.

Don't break the fidelity contract.
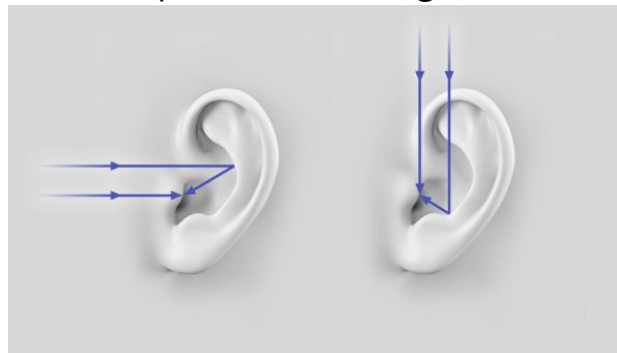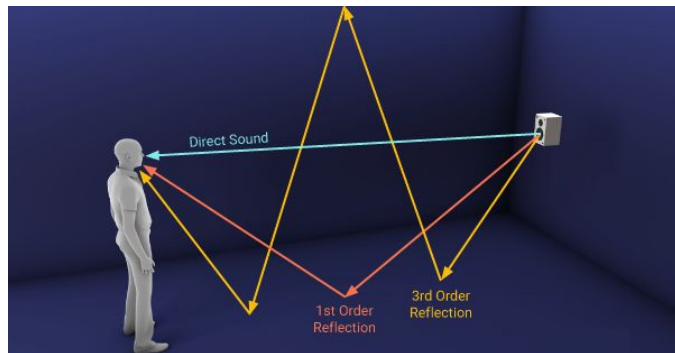
Don't forget (spatial) audio.

Inter-aural timings.
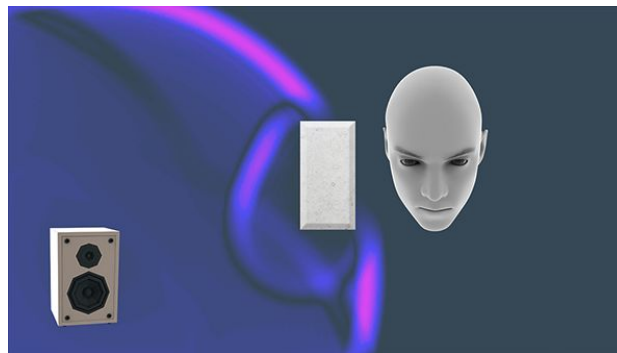
Spectral filtering,

Reverb

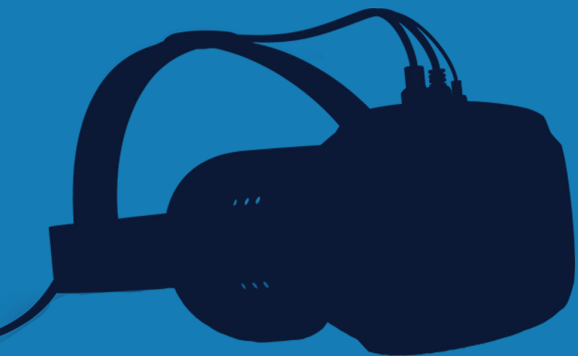Occlusion and diffusion.

Keep the user's attention.

Environment spaces

Screen Space (think HUD)

World Space

https://imgur.com/RjbxvQt

World Space

https://imgur.com/RjbxvQt

Anchored World Space

Lab 1: Building the Environment

vr.berkeley.edu/decal/labs