Introducing *VRoom*

The visual room inside the self-driving car.

The Project

Project Timeline: 4 weeks

For a Stanford d.school class, I and two other students took on the challenge of **redesigning the commute experience** in light of autonomous cars.

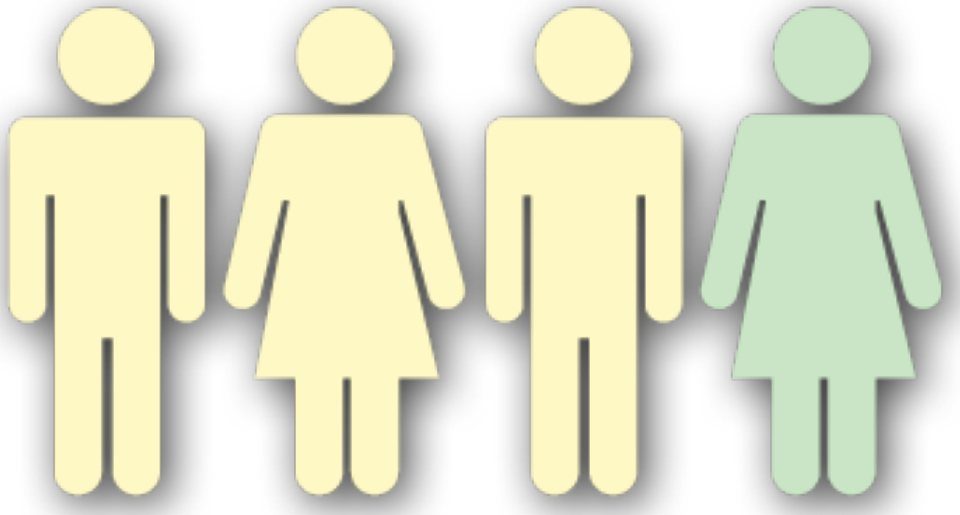
Through the process, we collaborated with a Project Manager at Renault Innovation Silicon Valley, receiving feedback & valuable car industry insights.

The Research

From 200+ online survey responses, we gathered the **top three stressors** commuters* experienced while driving.

*Commuters (travel between 30 min to an hour one way to work)

3 out of 4* commuters would **sleep**, given more time in the morning



*Based on our survey of 200+ commuters

The Identified Problem

How might we **remove commuters** from **environmental stressors** on the road in a way that makes them feel **relaxed** on their way to work?

Prototype 1: Infinity Room

Idea: Help users forget about outside traffic/road

Experiment: Alter sight & sound

Prompt: It's the morning, and you're on your way to work. Hop in for your daily commute!

Variation A: Reflective panels

For two 3-minute trials, we played:

1) Ocean waves soundtrack
2) Highway/honking soundtrack

Additional Goals:

- Observe what people would do in a car given open space (car structured like an ambulance - two flat benches on either side)

We chose reflective aluminum foil over black panels to emanate a sense of light

Variation B: Scenic Imagery

Identical prompt & trials as variation A

Additional Goals:

- Identify whether visuals help in mentally relocating car passengers

First Iteration Results

Generalizations

People felt **trapped** when windows were blocked → People *value awareness and safety* when in a car

One person **answered a work call** during the trial → Passengers feel comfortable diverting attention away from the road to *attend to personal things/business*

Next Iteration

So we ditched the panels, and instead, opted to **focus on simulating a relaxing environment** to zero in on the 75% of commuters who said they'd sleep more in the morning

Prototype 2: DozePod

Idea: Help relax users and get them that extra 30 min of sleep!

Experiment: Alter sight and sound and see how motion influences relaxation

Prompt: Hey friend, get in the car! We're gonna drive you around for a bit. (we had to recruit friends for this)

Long Story Short...

We carried out **two trials:**

1) 5 minute drive, user was told to relax
2) 5 minute drive, user was told to relax and given blindfold, reclined seat, and headphones filled with tranquil sounds from calm.com

For both, we used a **respiratory rate tracker** (Spire) to gather quantitative data to measure relaxation

(possible confounding factor: order of trials)

Second Iteration Results

Users reported feeling **sleepier and groggier** after the trial than they were at the beginning

→

Generalizations

Commuters value sleep, but *need to feel alert and awake* upon arriving at work.

Final Iteration

Building off our second prototype and applying our learnings from the first and second iterations, we created a **mentally invigorating environment** to shake off their morning sleepiness.

Prototype 3: VRoom

Idea: Give commuters a burst of mental energy

Experiment: Virtual Reality

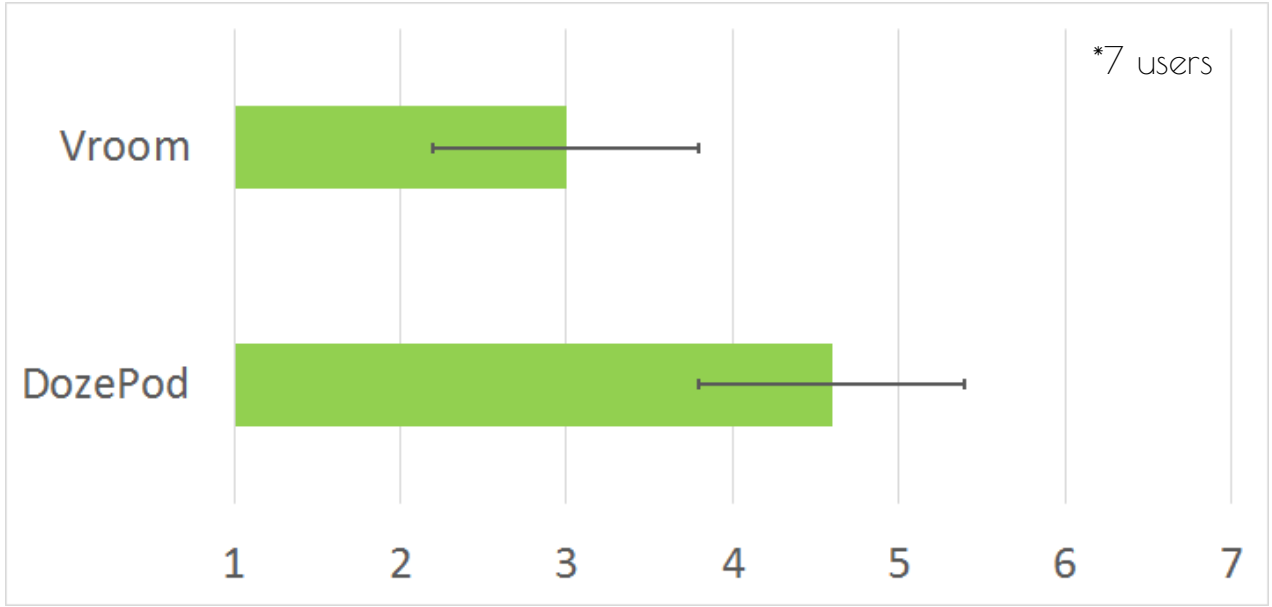
Prompt: Same as prototype 2

What would it be like if the entirety of a car's inside walls was *digitally programmed with virtual reality*?

We simulated this VR user experience with Google Cardboard and ran the same trials again.

Average Awareness Levels

(self-reported*)



Forgot you were in a car

I'm in a car I'm in a car I'm in a car...

What we found was that...

...visual stimulation actually made our users *less aware* of the car's motion, stops & turns.

Next Steps...

more users

make visual reality imagery optional

full simulation of relaxation into mental stimulation over a 45 minute period