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SENS VR System

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SENS VR SYSTEM
AMIN SHIRAZI

CONTENTS

1 - Project Overview

2 - Research

3 - Prototyping and Testing

4 - Product Specifications

5 - DEC Outcomes

01

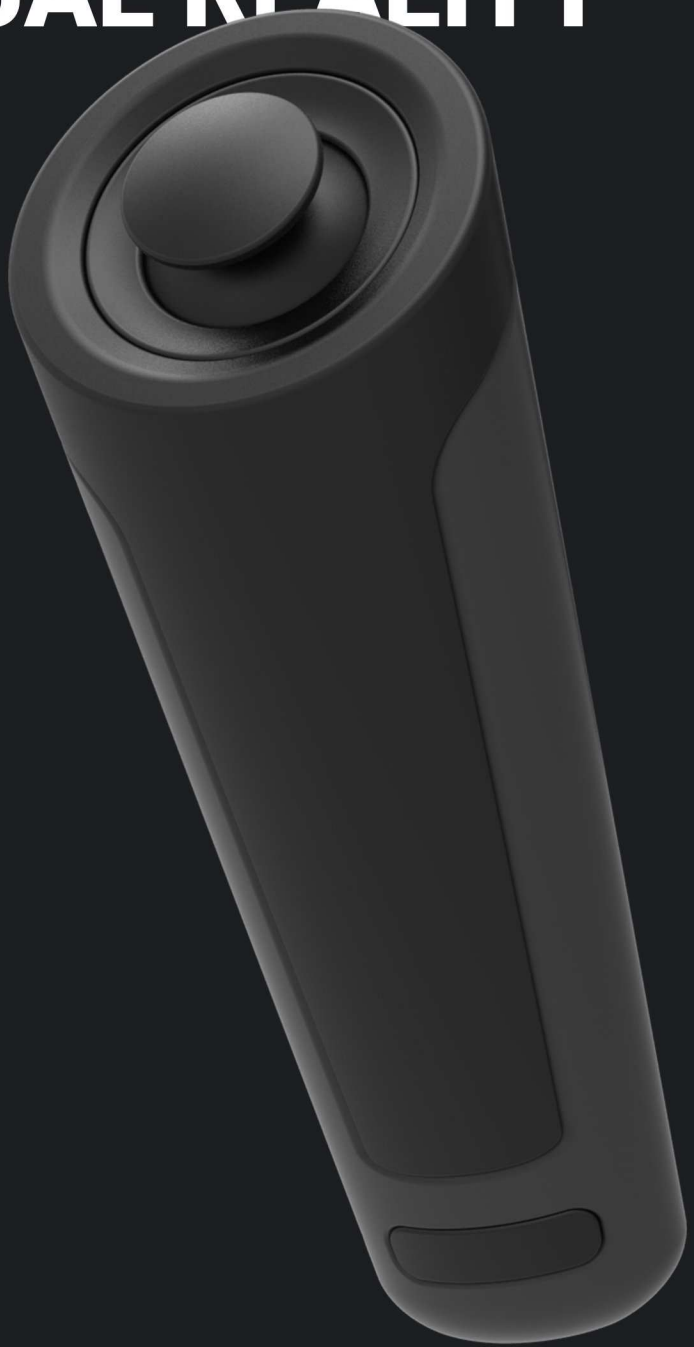
SENS
VR CONTROLLERS

VR IS GREAT
CONTROLLERS AREN’T

Virtual reality is cutting edge with an estimated market worth of 30 billion by the year 2020. Despite its success, the controllers don't let you interact with the virtual world intuitively. They don't let you open your hands, forcing you to pull a trigger or press a button instead. I set out to design a controller that makes interacting with VR more intuitive. When you open your hand, so does your character.

REACH OUT AND GRAB

VIRTUAL REALITY



SENS utilizes an elastic strap on the back of the controller to keep it attatched to your hand while capacative zones track your fingers. With SENS, you can reach out and grab objects in the virtual world.

OPEN YOUR **HAND**

CAPACITIVE **ZONES**

TRIGGERS

SIDE BUTTON

Three capacitive zones track each of your fingers, translating their positions to your character in game. Capacitive sensors transform the joystick, side button, and triggers into zones.

THUMBSTICK

FUTURE-PROOF
TRACKING

While SENS utilizes the capacitive sensors for much of the finger tracking, the leap motion sensor acts as a secondary input which helps assure accurate positioning. Meanwhile, the Oculus camera tracks the controllers.

Y
B
X
A

INTUITIVE **CONTROL**

I designed SENS to be comfortable and intuitive. The grip is meant to mimic a wide range of objects while feeling as if its not even there when your hand is open. Combining intelligent design and creative applications of existing technology makes SENS perfectly suited for the current state of VR.

SENS
HAPTIC VEST

FEEL **VR**

The second half of the SENS system, a haptic vest meant to make the user ‘feel’ virtual reality. Current products rely solely on vibrations. With SENS, I set out to deliver a more complete experience in a refined package.

The vest was developed along with the controllers, meant to work together to deliver a more immersive experience. As a system, they share similar form language, colors, and technology.

htc

FINAL
DESIGN

SENS

htc
SENS

SENS

VIVE

VIVE

htc

htc

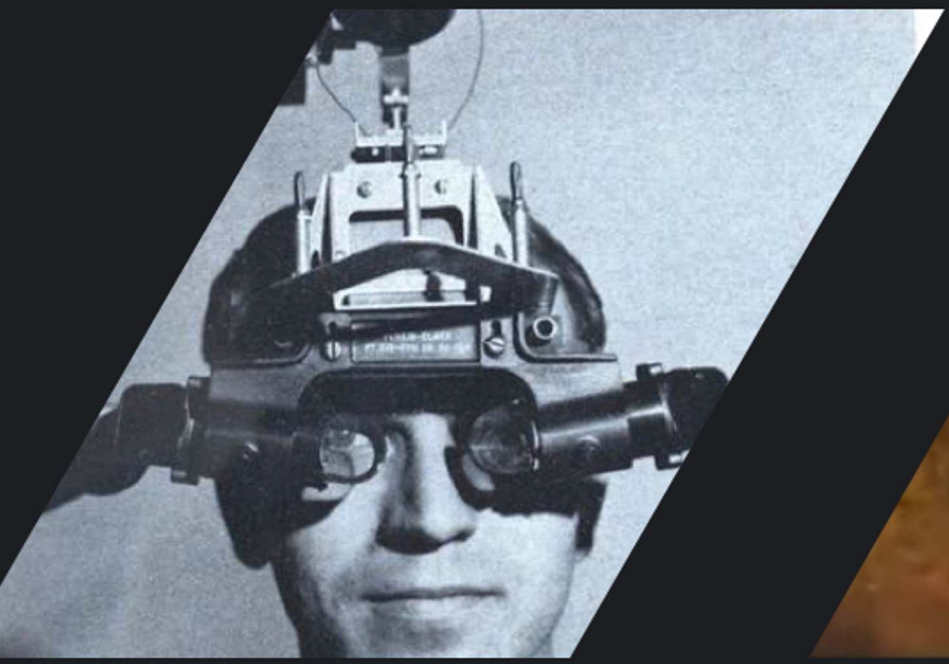
htc
VIVE

htc
VIVE

oculus

02

RESEARCH



1965

The Discovery

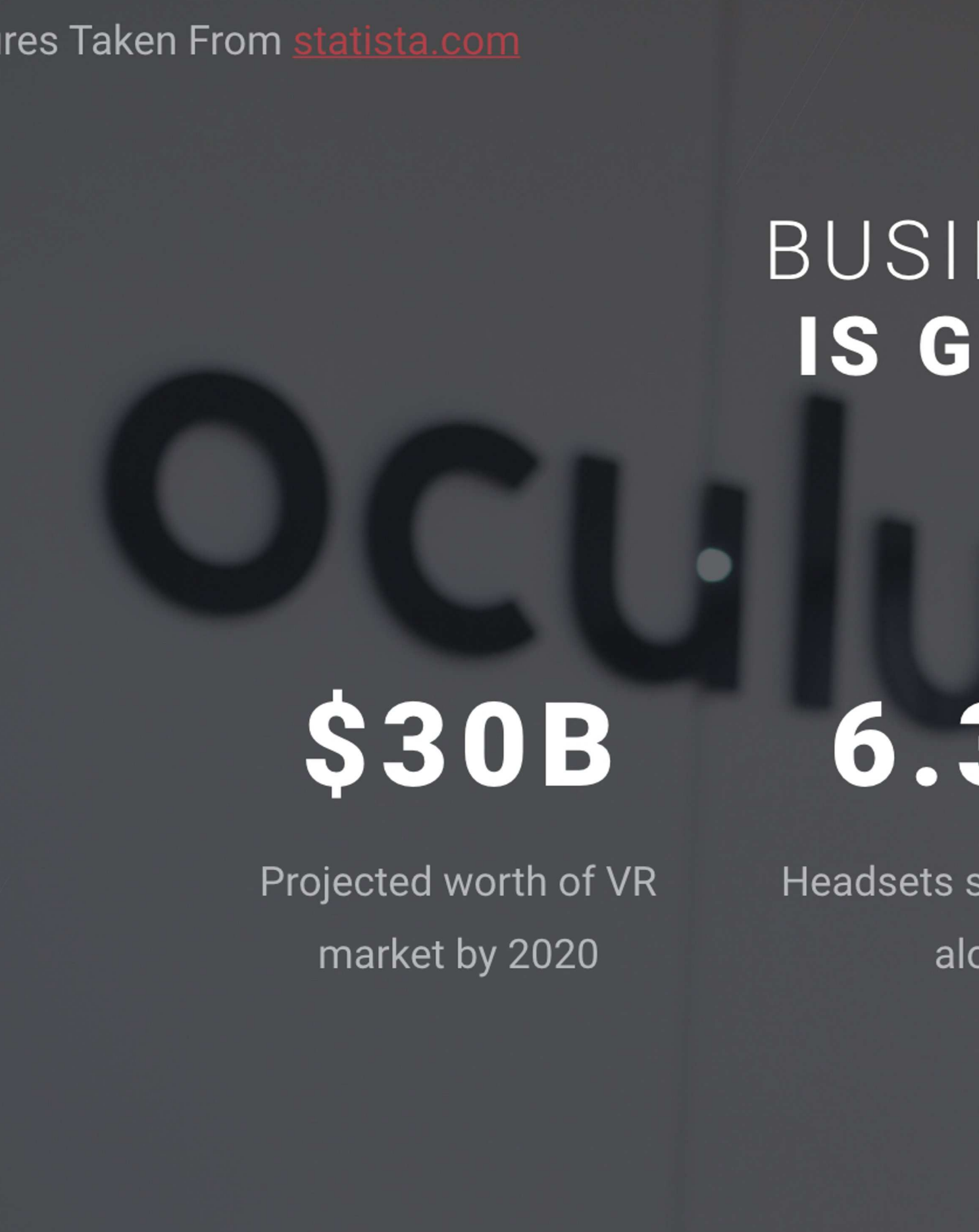
1995

The First Attempt

2016

The Perfect Fit

ures Taken From statista.com



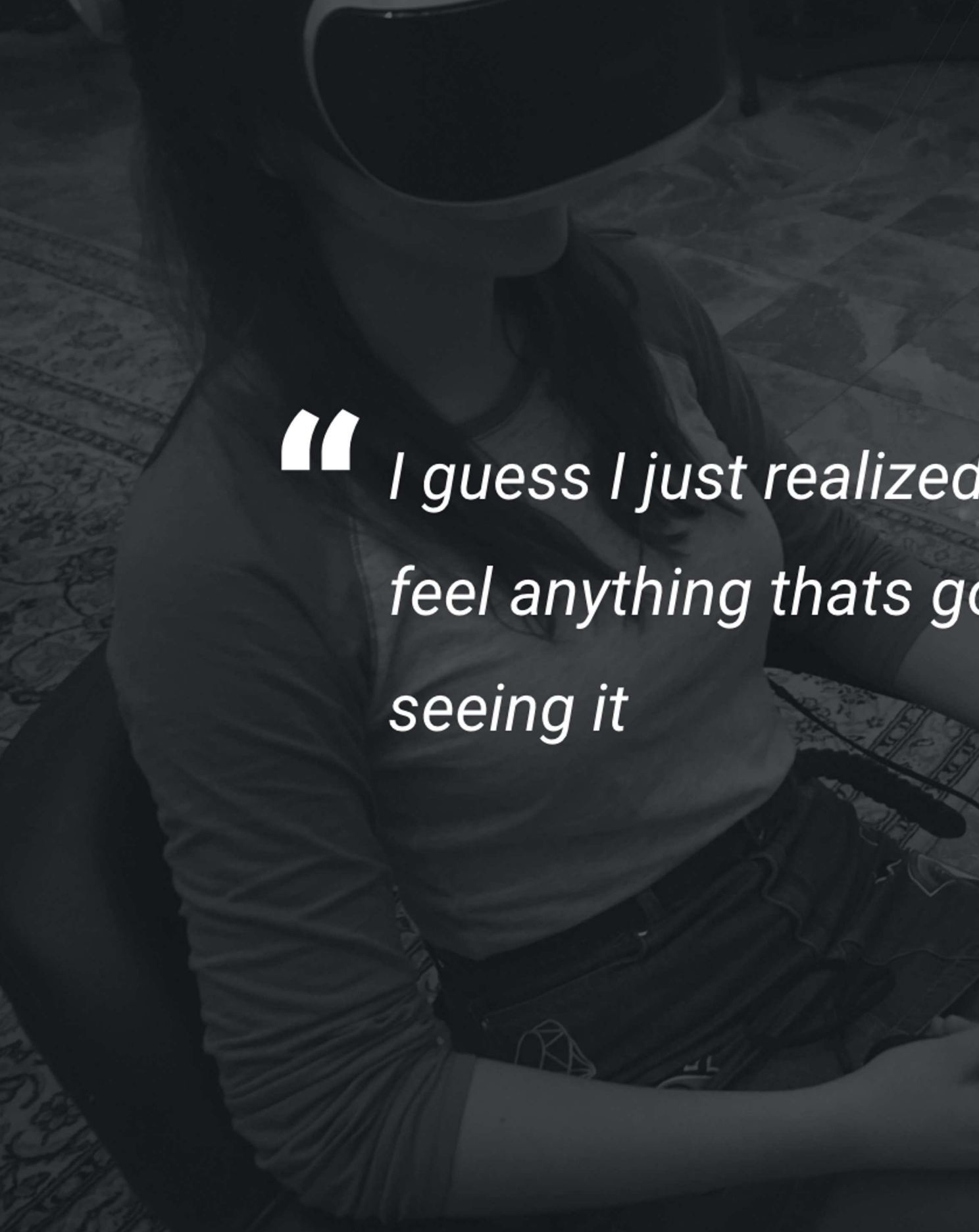
NESS
OOD
3M
sold in 2016
one
50%
Surveyed Individual
“Very Interested” in VR

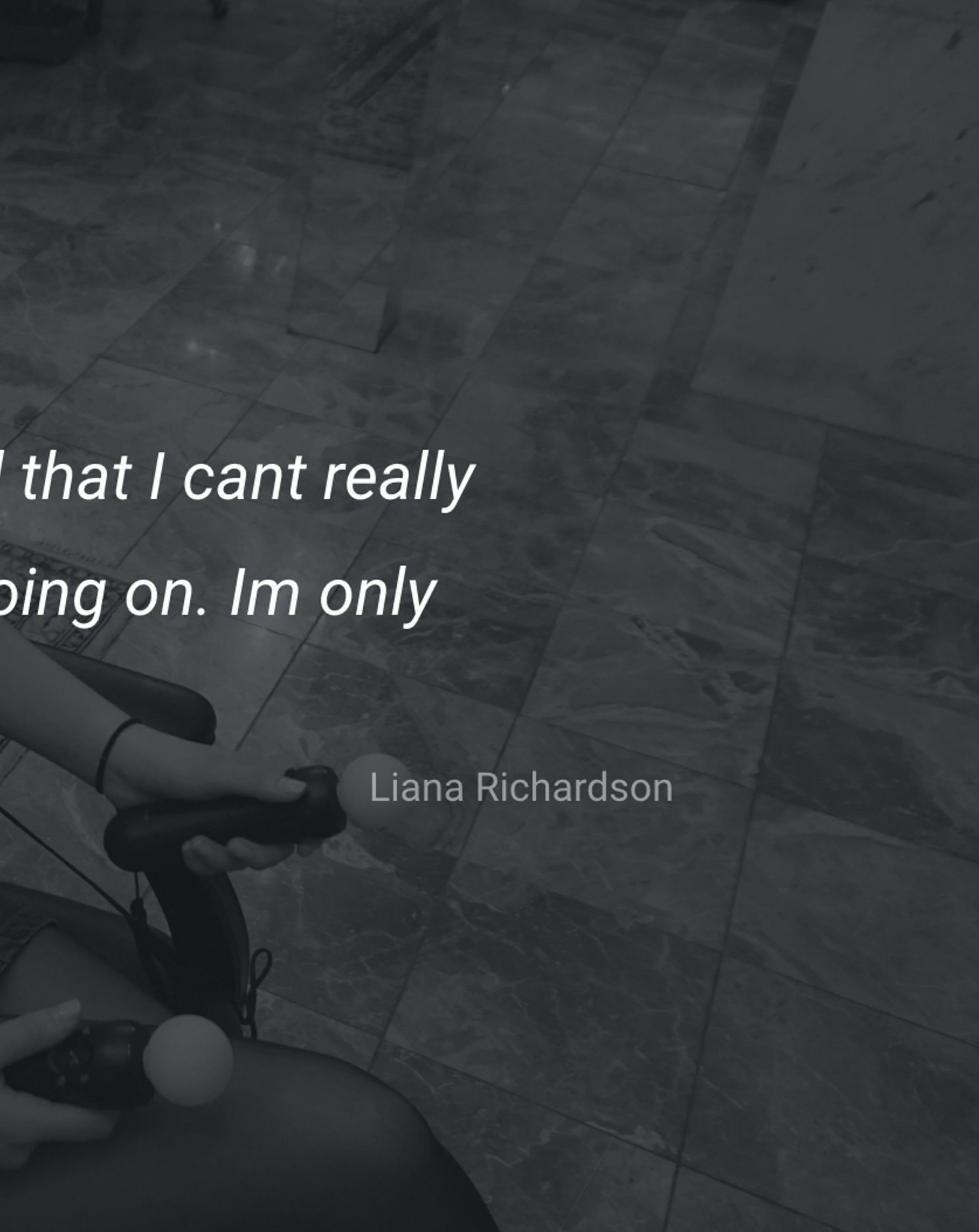
“
Our sense of touch is cru
our unique human experie

cial to creating

ence

Dr. David Linden


“ I guess I just realized
feel anything thats go
seeing it


I that I cant really
oing on. Im only
Liana Richardson

Adi Robertson

"We can't have real virtual reality without a sense of touch"

– The Verge

Ricar

"Prop
Reality r
-Huffi

rdo Diaz

ber Virtual
needs touch"
ngton Post

Paresh Dave

"Touch is the next
critical step for
Virtual Reality"
-Los Angeles Times

03

PROTOTYPING

TESTING

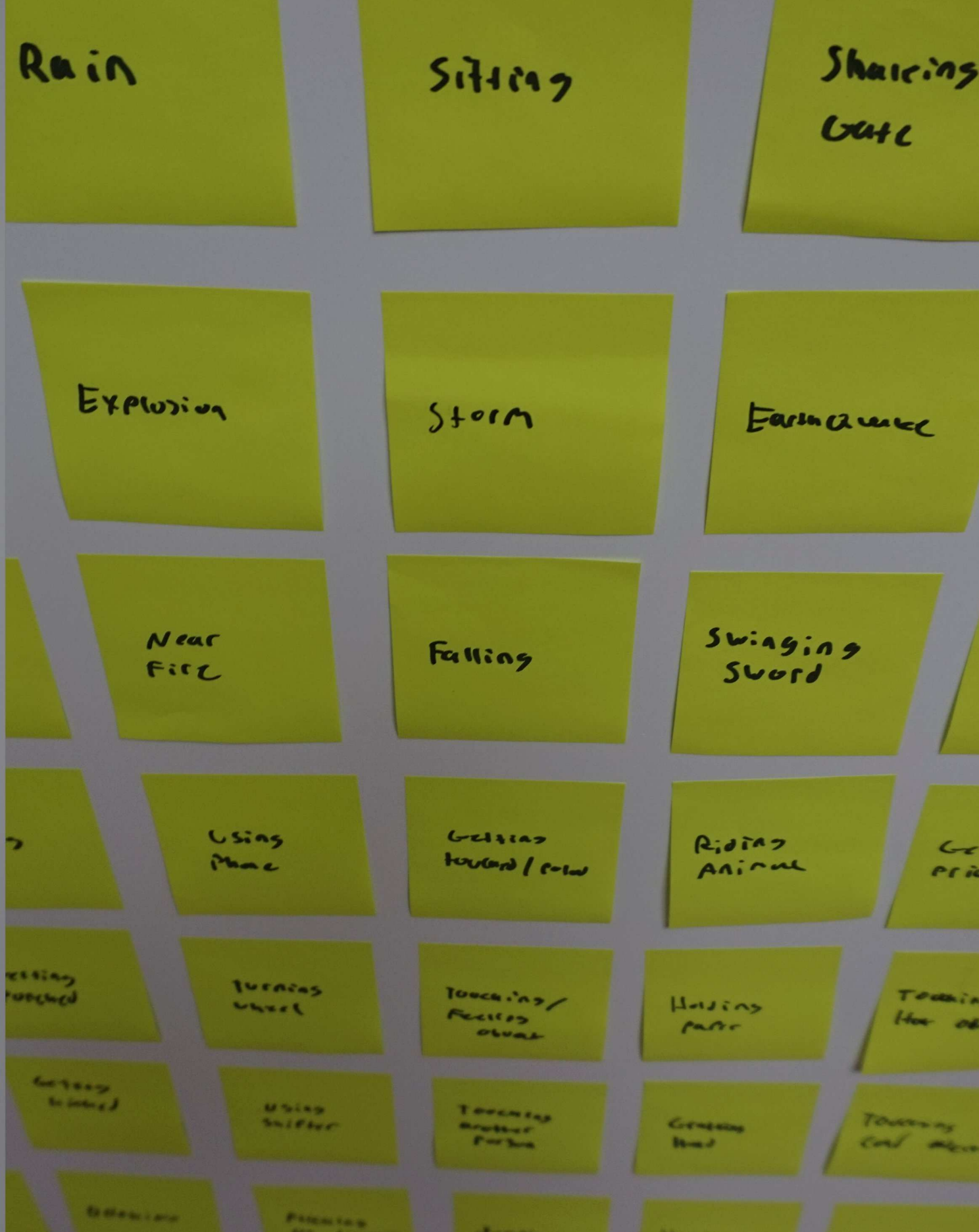
MODELS
FOAM TO 3D PRINTS

TESTING

PHILADELPHIA UNIVERSITY
1884
Student Health Center says,
"H_2O is the way to go!"

GAMEPLAY

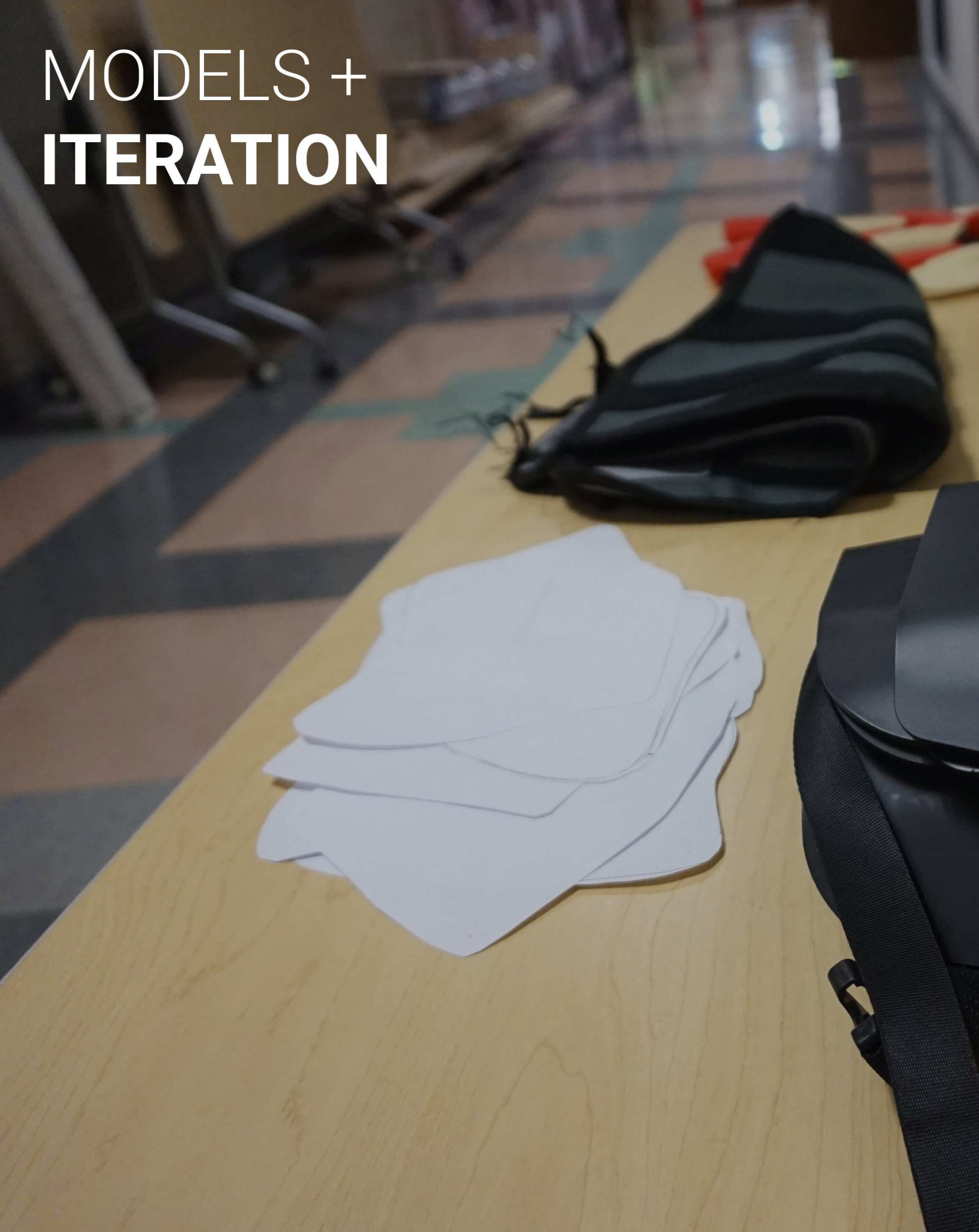
Before I could start designing, or even brainstorming, I had to begin cataloging the experiences characters felt in game. This list would help me decide what the vest had to make the user feel and where they should feel it.

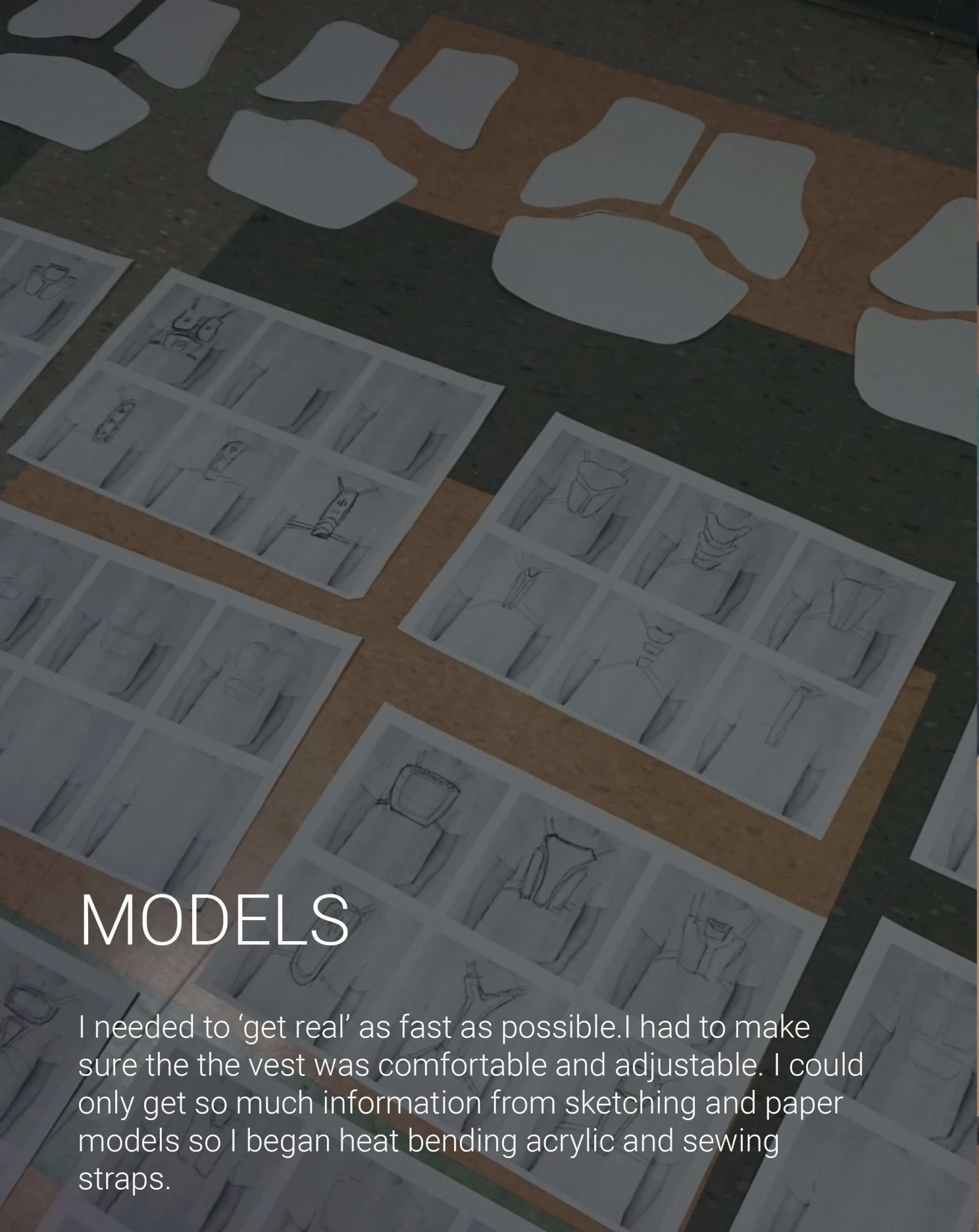

Rain
Sitting
Explosion
Storm
Near Fire
Falling
Swinging Sword
Using Phone
Riding Animal

TESTING

I needed an understanding of the appropriate technology before I could design the vest. That meant testing various components at different positions. I sewed a vest with velcro strips so that I could easily test each component.

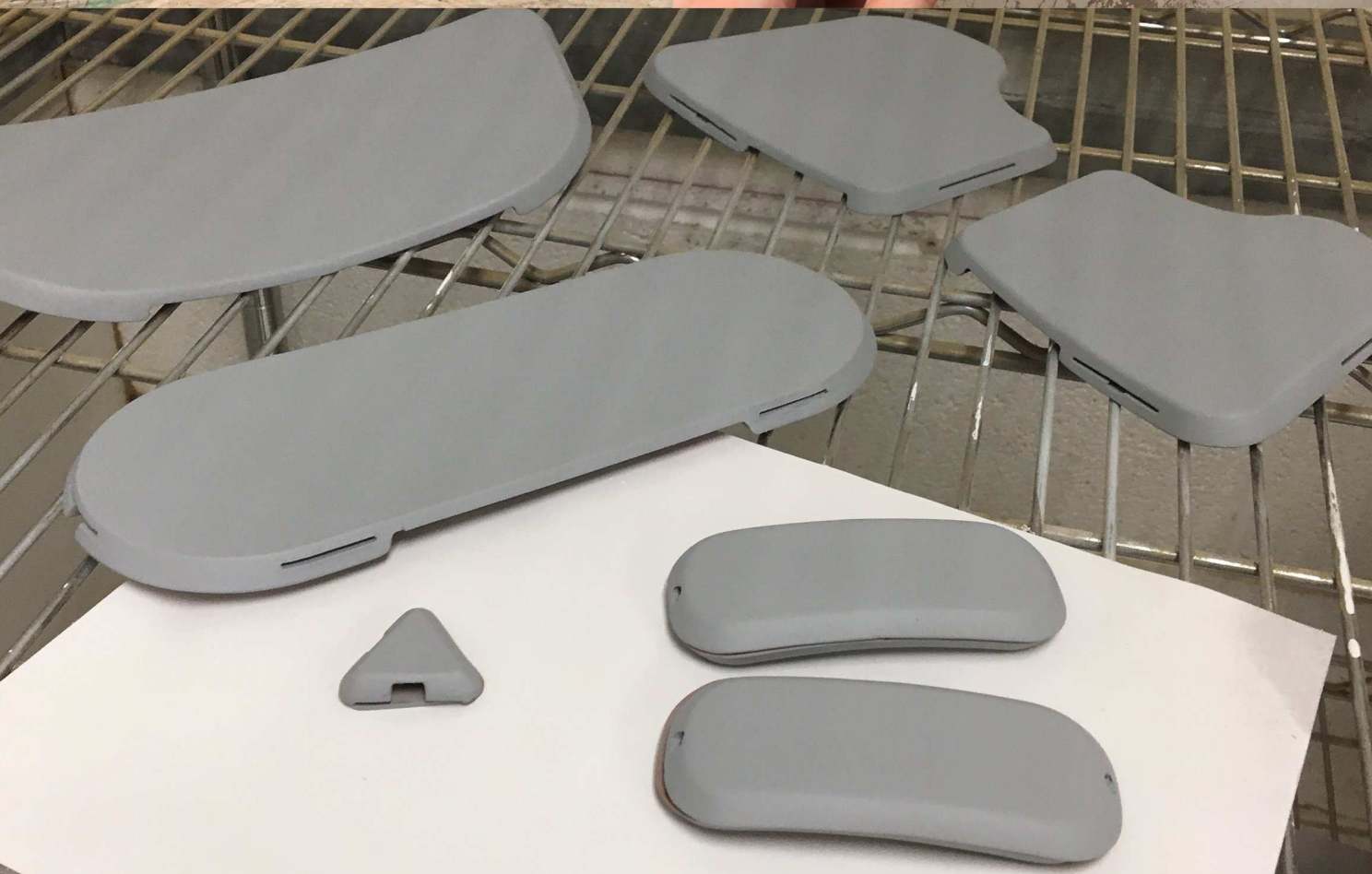
MODELS + **ITERATION**





MODELS

I needed to ‘get real’ as fast as possible.I had to make sure the the vest was comfortable and adjustable. I could only get so much information from sketching and paper models so I began heat bending acrylic and sewing straps.



RYLON
ALKY FINISH
anvil gray

04

PRODUCT
SPECIFICATIONS

MANUFACTORING **DETAILS**

14 Individual pieces

Injection Molded

Minimal Cams and Undercuts

ABS and Aluminium

4 Thermoelectric Coolers

4 Heatsinks

4 40mm Fans

4 Vibration Motors

20 Coin Vibrators

1 LED Backlight Panel

SENS

05

DEC CAPSTONE OUTCOMES

Integration & Skills (Section 2, Research)
Integrate the skills and knowledge acquired through the DEC Core curriculum to propose solutions to real-world problems, through:
Strategy Identification
Formulation of value propositions
Identification and explanation of systems
Formulation of research questions

Synthesize Interdisciplinary Work (Section 3, Prototyping)
Synthesize interdisciplinary work (both collaboratively and independently) through:
Proposal of solutions/hypotheses
Interdisciplinary collaboration

Communicate Findings (Section 1, Project Overview)
Communicate capstone experience findings effectively using multiple modes

Professional Relevance (Section 1, Project Overview)
Evaluate the relevant professional, ethical and social responsibilities associated with the capstone experience

Global Context (Section 1, Project Overview)
Explain the global context of the capstone experience

Applications | Trends | Technologies (Section 3, Prototyping)
Interpret emerging applications/practices/trends/technologies as they apply to the capstone experience

Capstone Experience (Section 2, Research)
Relate the capstone experience to relevant contemporary issues

blurb