



HEALTH X SCHOLARS

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VR UI Review



WHAT IS UI?



User Interface (UI) is any method by which the user interacts with a device or experience.

In AR and VR, that means a whole bunch of things...

- It can mean the headset or computer
- Devices in the virtual or real world
- Avatars who act as people or animals
- Environment both seen and unseen

Grant recipient projects reflect the broadness

- Spatial information based on your personality
- Equipment testing
- Mixed reality
- Gloves/wands/voice and future?
- Adaptive information to improve performance

02.

Wands – Are the basics good enough?

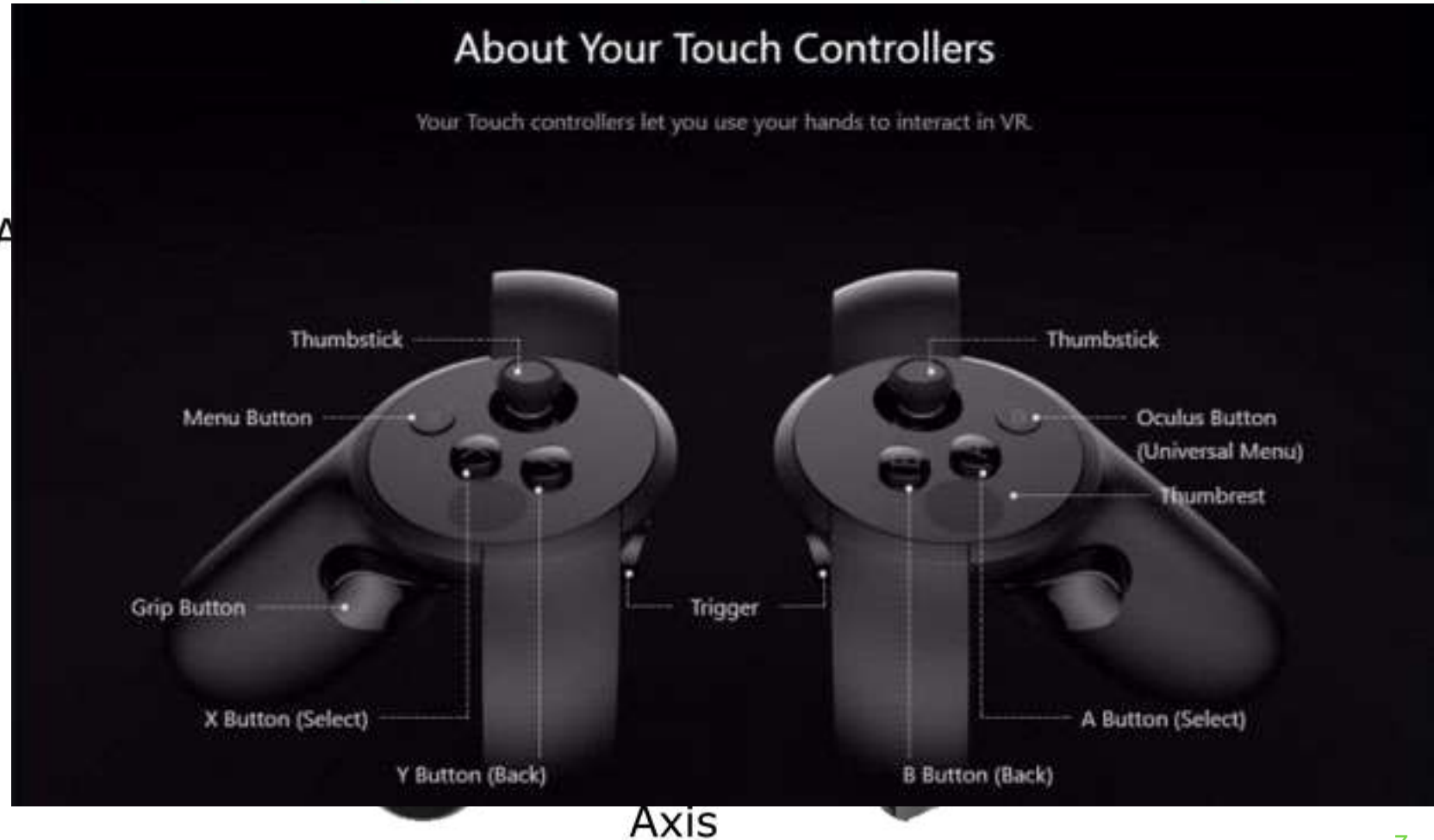




WHAT THEY ARE



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EFFECT ON USERS



What is the effect on cognitive load?

Our experience

- Fire in the OR
 - Teleport
 - Grab
 - Use
 - Point and click
- Usability testing
 - Initial testing
 - Tutorial
 - Tutorial testing



Study results

- Non-gamers struggle¹
- Users need outside instructions
- Users can't remember controller's main function
- Users couldn't remember how to select an object
- They are good for learning²

A photograph of a firefighter and a paramedic in a locker room. The firefighter is in the foreground, wearing a dark jacket with 'FIRE' written on the back and a helmet. The paramedic is to the right, wearing a dark jacket with 'DOCTOR' and a medical cross symbol on the back. The scene is dimly lit with a teal color cast.

03.

The Promise of Gloves

The Reality?

WHY GLOVES?



What is the effect on cognitive load?

Profound affordances, aka immersion

- Feeling of presence¹
 - “Tricking” your mind into feeling that you’re there
 - Heightens awareness, attentiveness, memory
- Embodiment
 - Agency associated with manipulating content
 - Hand gestures may be special^{2,3}
 - Gestures build neural pathways, i.e. muscle memory
 - May reduce cognitive load³



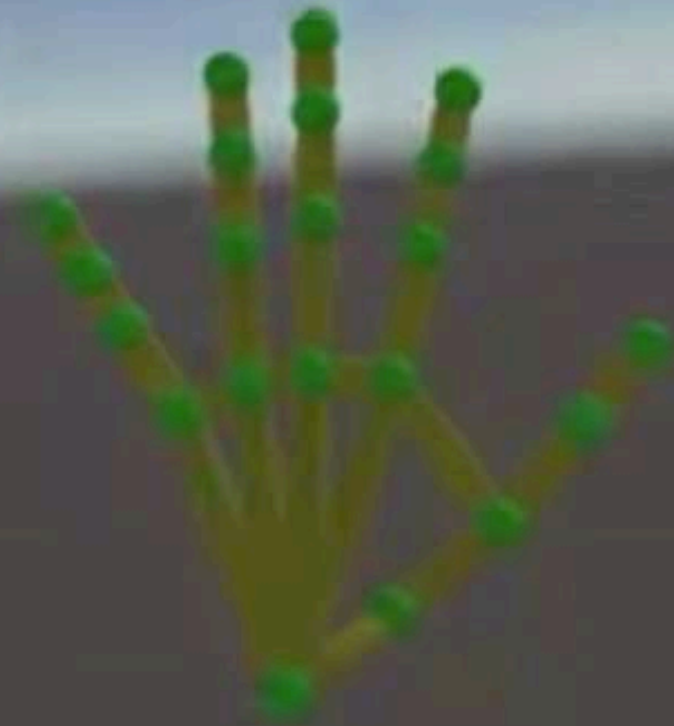
WHY NOT GLOVES



Drawbacks to hand tracking/gloves

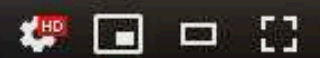
- Suspension of disbelief
 - Latency
 - Drift





Pause (k)

0:00 / 1:04



WHY NOT GLOVES



Drawbacks to hand tracking/gloves

- Suspension of disbelief
 - Latency
 - Drift
 - Occlusion
- Problems with high use
 - Most have crushable elements
 - How do you keep them sanitary?
- Cost
 - Some are inexpensive ~ \$70
 - Up to over \$4,000

And...

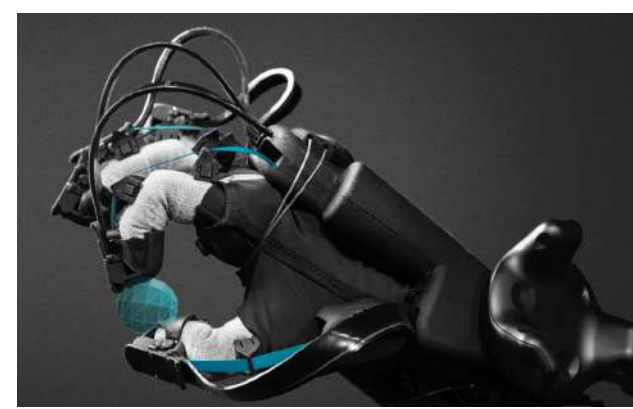




STATE OF GLOVES



There are a bunch! Some cool features!



Neue Zürcher Zeitung



OTHER UIS



Where is UI research going?

- Gesture
 - This is hand tracking
 - Requires users to learn gestures
 - Doesn't aid if not congruent
- Mood
 - Require sophisticated equipment
 - Costly right now
 - No standardized way of assessing the data
 - Development of scenarios is costly
- Gaze
 - Tracking eyes
 - Pretty costly right now
 - Fairly high learning curve for users
 - Not very accurate



04.

Can you do a voice UI?

VOICE UI



What is a voice recognition user interface?

- Types
 - Conversation
 - Instruction
- Why it's good
 - Cost
 - No real difference between users/non-users
 - Can mimic user's actual actions well
 - Reduced cognitive load – we think





VOICE UI



- Challenges
 - Accents
 - Enunciation/pronunciation
 - Recognizing phrases
 - Background noise
 - Latency
 - Intuitive design

STARTING SCENARIO Scenario7A

LEARNER
"are you feeling" (check_patient)

RECOGNIZED INTENT check_patient

LEARNER
"Phyllis synchronized cardioversion at 200 joules" (start_cardioversion_120)

RECOGNIZED INTENT start_cardioversion_120

CORRECT RESPONSE

STARTING SCENARIO Scenario7B

LEARNER
"synchronized cardioversion at 199 joules" (start_cardioversion_120)

RECOGNIZED INTENT start_cardioversion_120

INCORRECT RESPONSE

INCORRECT RESPONSE

LEARNER
"Phyllis synchronized cardioversion at 200 joules" (start_cardioversion_followup)

RECOGNIZED INTENT start_cardioversion_followup

CORRECT RESPONSE

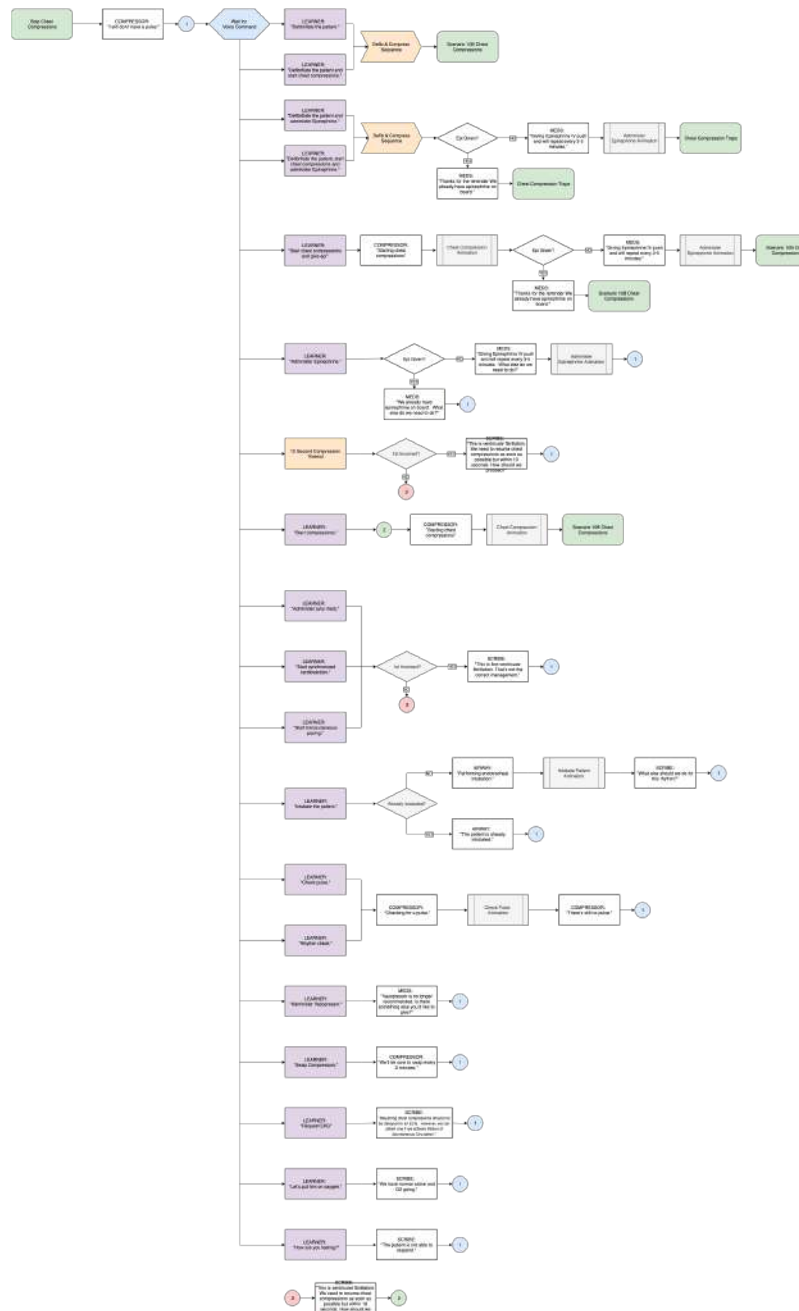


APP LOGIC



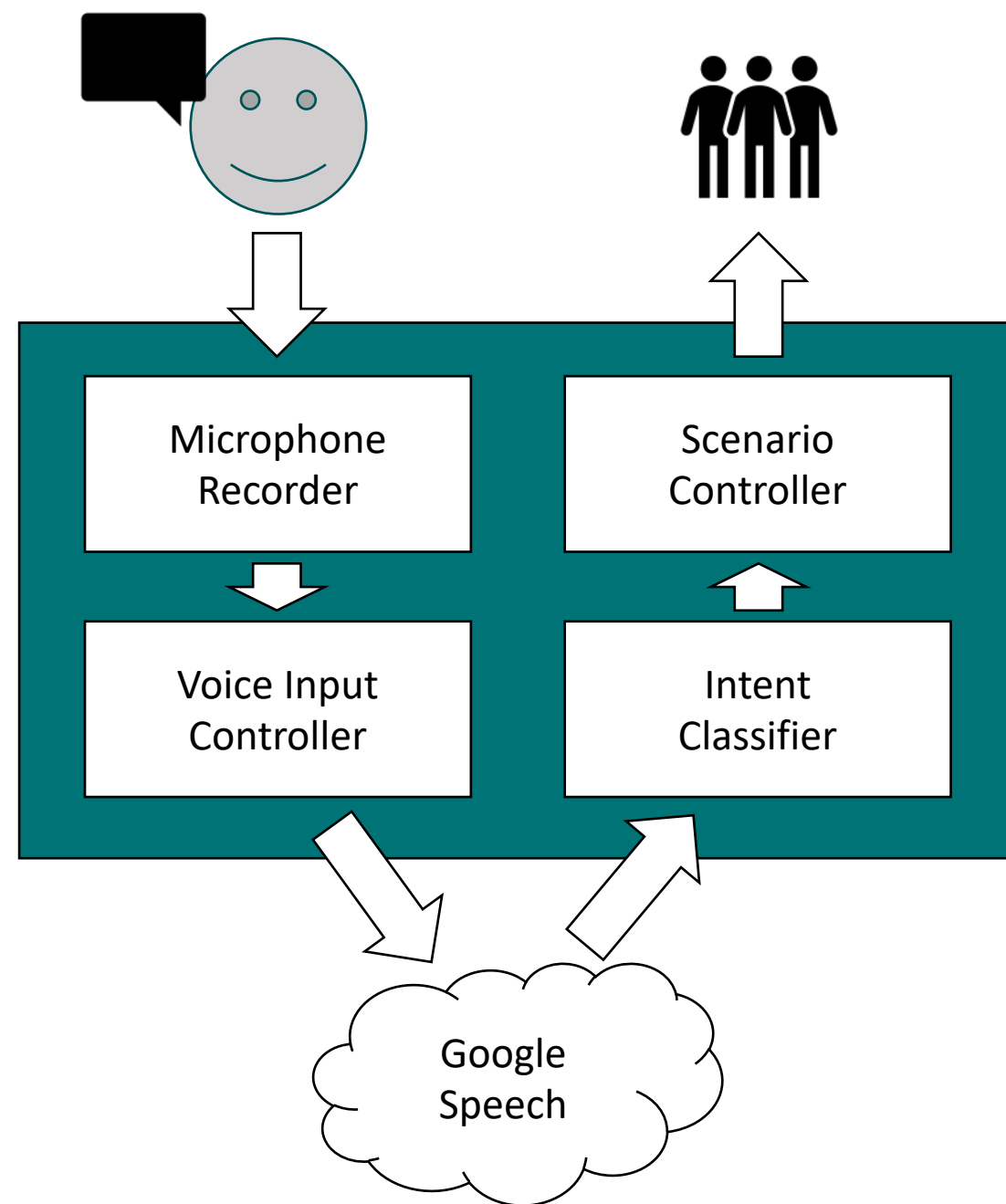
Flow charts

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APP DESIGN



USER EXPERIENCE



Getting users used to a voice UI

- How do you know when you can talk?
 - Problems with listening all the time
 - UI design with avatar gaze
 - UI design with gaming elements
- How do you know what to say?
 - Model commands early
- How do you give feedback?
 - When do you give it
 - It matters how you say it

Multimodal voice UI

- What is it?
- Do you need it?
- How do you keep cognitive load reasonable?

A firefighter in a dark jacket with "FIRE" written on the back and a paramedic in a white jacket with "DOCTOR" written on the back, standing in a locker room. The image is overlaid with a teal tint.

05.

Wands and Voice

Practical experience



ROBERT PUTFARK



EMS Captain
Arvada FPD



A photograph of a firefighter and a paramedic in a locker room. The firefighter is in the foreground, wearing a dark jacket with 'FIRE' written on the back and reflective yellow and silver stripes. The paramedic is to the right, wearing a dark jacket with 'DOCTOR' and a medical cross symbol on the back. The background shows lockers and another person. The entire image has a teal color overlay.

06.

Questions



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Come back for the
**Next
Session**
3:15 PM