Intro

website:

kevinqu2004.github.io/cs-584-physical-computing

GitHub:

github.com/kevinqu2004/cs-584-physical-computing

Final Project Ideas

challenge: cheap, easily replicable electronics

1. watch with display and additional sensors on clothes for monitoring

2. exoskeleton arm with motors (3D printed chassis?) (electrodes or buttons on arm for control?)

3. powered gloves with motors to give feeling and resistance when interacting in VR

4. very small and cheap drone (3D printed chassis)

5. separate robotic arm that mimics a human one (for use in dangerous(?) situations)

6. self centering mouse pad (motorized) don't have to move mouse back to center

7. wearable self retracting mask (like the ones you see in movies)

8. sensor to tell if you've left the stove on when the front door is opened

9. detect facial movement using electrodes then map onto a virtual avatar

10. put a small language model onto an Arduino (no clue how that can go wrong)

Selected Idea: exoskeleton arm (because it sounds cool af)
Details: (kind of like several above ideas rolled into one)

1. made out of wood probably (will see if I can get aluminum)

2. inner layer will be lined with buttons to detect movement

3. joints will have potentiometers to detect movement

4. hands will be activated by strings

5. joints will also have motors

6. will likely just be a frame to keep it light

7. inner layer may be separable

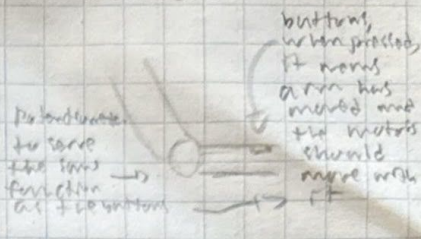
8. sensing components and actuators on different Arduinos

9. will probably only be for one arm

10. may need more than 1 Arduino

Elevator pitch

- focus: video games and entertainment / cultural applications
- will have little practical use outside that area since it is only a small prototype
- use in VR to give tactical feedback
- cheap & open source
- cosplay (?)



V1:

What's wrong with VR today? Sure, you can see objects and interact with them but you don't feel them. It is essentially a phone strapped to your face. I want more from my gaming experience. I want what has been promised in movies, books and ads alive. As such, I propose an exoskeleton arm that can sync the virtual and the real in a way that players can finally feel for themselves.

Feedback: (4 years older, business major)

- "why? why an 'exoskeleton' though?" → how do I say "it's not professional"
- "isn't Meta already doing this" → not just for gamers

V2:

In this day and age, the line between what is virtual and what is real is already blurry. I, however, want to blur it some more. I want to make a mechanical exoskeleton that can serve both as a way to interface with VR and a way to bring VR to life. It will be able to both provide tactical feedback in the virtual world and bring the beloved characters to life through cosplays.

Feedback: (30 years older, doctor + investor)

- "who would use this" (serious question, not mocking) → not strong, but cheap
- "how strong will it actually be?" → you can use it for any
- "why would you need that for cosplay?"

V3:

In this day and age, the line between what is virtual and what is real is already blurred. I, however, want to blur it some more. Virtual Reality already is already an immersive world for gamers yet it only includes two of five senses. I want to up that to three, with an exoskeleton powered exoskeleton, we can bring tactile sensitivity and feedback to VR. Not only that, with how cheap and accessible the open source systems is, it can have a wide range of applications besides. Everything from being used in cosplay to medical applications.

Reactions (to business card):

*persons 1-3 were interviewed in the tech lab

Person 1:
- "wow"
- *immediately accidentally drops it
- "how did you make the text line up with the folds"
- "very sturdy"
- "cool"

Person 2:
- "so did you insert it first, then fold it"
- "so innovative"
- "where are the engravings"
- "good insight" (regarding exporting software)
- "good idea"

Person 3:
- "so was there a grade for creativity"
- "looks fun"
- "is that made out of cardstock"
- "cooler than those thin metal cards"
- "must have been a pain to fold"

Person 4:
- Fengran Wang
- add feathers
- more detail
- 3D is creative!!!
- Add something under the wings
-
-

Person 5: Olivia Kim
- move letters so it isn't folded
- very cute
- I like the 3D.
- cute that it brings back elementary memories
- give it eyes.