Senior Design Bi-Weekly Status Report; Spring 2024

Project Advisor Kickoff Meeting:

01/23/2024 @ 5:00 PM in Senior Design Room

Agenda:

- Quick introduction and team bonding.
- Review of feedback from the 491 design document. Create plans to address weaknesses and fit requirements.
- Key discussion points for changes or improvements to the design:
  - Consider an alternative mounting system for the battery pack and Raspberry Pi.
  - Consider items to serve as a mounting platform for the camera, such as a hard hat, baseball cap, or modified GoPro mount
- Discuss objectives and requirements for 492 final design review:
  - Go over the rubrics and provided instructions.
  - Begin brainstorming concepts for a final report, project poster, and oral presentation.
- Discussion of the schedule and milestones for the project:
  - Review the Gantt chart and assess our progress.
  - Make any adjustments to the schedule as needed.
- Review your team process and discuss any changes or improvements
  - Discuss more communication.
  - Schedule in-person work sessions.
- Q&A session
  - We will allow time for any members who want clarifications on the project or their role going forward to ask questions.

Discussion Notes and Decisions:

Discussion Topics:

- Obtained a D455 camera. This is not our originally specified model, but meets our design specifications nonetheless.
- We are currently on schedule as set in our Gantt chart. We will continue to use this timeline going forward.
- Rescheduling our weekly advisor as one member can no longer make Tuesdays at 5 pm. We may alternate between meeting on Tuesdays and Thursdays, but going forward, we will continue to meet on Tuesdays.
- Alternative mountings for Raspberry Pi and the battery. Mounting on the back is particularly inaccessible. We recommend mounting these devices on the waist, similar to a microphone, as this would allow easier access to the user. Mounting these components on

the back reduces the chances they will be dislodged, and is a more ergonomic junction point between the head and the forearm than the waist is. As of now, we plan to mount these components on the back.
- The camera could be mounted on several things. A hard hat would be solid, immobile, and reliable but would also be bulky and uncomfortable. A baseball cap may be more comfortable but would be a less reliable mount. Any shifting of the camera poses a potential problem for the navigator, so sturdiness is paramount. We will proceed by purchasing a GoPro mount, a technology already shown to hold a camera reliably and create a custom bracket to connect our d455 camera to it.

Assigned Tasks:
- Make a sleeve prototype by the next meeting on January 30th. (Alexander)
- Extend wires on the remaining haptic motors and attach the haptic motors to the female, requires the new heat shrinks to arrive.
- connecting pins for the Raspberry Pi (Yogi).
- Construct a prototype camera mount on the wearer's head (Jacob).
- Test the battery to ensure it can provide the necessary power to drive the camera, Raspberry Pi, and motors.

Summary:

Machine To Human Vision

Client: Sami Bensellam

Advisor: Alexander Stoytchev

Full Attendance: Alexander Stoytchev, Sami Bensellam, Alexander Black, Jacob Burns, Yogesh Chander, Jacob Lyons, Sergio Perez-Valentin

- Summary of the main points discussed:
  - We discussed the following design decisions that needed to be made to continue making the prototype of our mounting platforms.
  - We discussed project requirements and deadlines, ensuring we are on track to deliver a satisfactory product by the end of the semester.
- List of any decisions made:
  - We will mount the Raspberry Pi and battery to the back.
  - We will mount the camera to the wearer's head using a modified GoPro camera mount.
- List of any actions to be taken:
  - Buy 26 AWG heat shrink for the wires.
  - Create prototypes for the mounting hardware for the camera, motor sleeve, and battery/Raspberry Pi pack, and ensure usability and comfort.
- Next steps for the project:
  - The haptic motors are to be extended, and a sleeve will be made.

- After the completion of the above steps, we will attach the motors to the sleeve by using beads glued to the motors. Once this is done, we can begin communicating between the sleeve, raspberry pi, and camera.
- Move all of the raspberry pi 3 functionality over to the raspberry pi 4.
- Reproduce the existing Kinect functionality over to the new D455 camera.