1. Team Name: VRCube

2. Team Members and Roles: (Depending on the strengths of each member as an example)

Anthony – Project Leader – VR Programmer, Software Architect.

Greg Retter - Gathering sensor data, programming websocket.

Brian Wagner – Gathering sensor data and analyzing.

Nawal Al-harbi – Code testing and refactoring.

3. Goal of the Project: (Describe here which problem are you solving and your motivation)

With this project we are trying to analyze the differences in how people interact with objects in the physical world versus the virtual world by designing a glove that allows a person to manipulate a cube in VR. Since objects in the physical world provide different stimuli to the person interacting with the object that are non existent in the virtual world (for example objects in the physical world have a weight to them and provide tactile feedback when interacting with them), the idea is that people will interact with similar objects in both worlds in slightly different ways (such as applying more force to objects in the physical world versus the virtual world). We want to be able to capture some of these subtle differences by analyzing data provided by the sensor board, and want to build a model to analyze the differences. This data and model can be useful for people building virtual reality applications, as it can provide a way for them to calibrate their applications to give them a closer feel to interacting with virtual objects in a similar way as people would interact with real objects. We think this project will be useful in VR gaming, Engineering Design, Training Apps, Modeling and many other applications.

4. Software and Developing tools:

- IDEs and Text Editors:
    - VS Code and extensions to use various programming languages (such as Python)
    - Eclipse with projects and extensions to use the sensor tile
- Software libraries and languages
    - Python

        - Anaconda
        - Data Science packages (such as Numpy, Pandas, Matplotlib, etc.)
    - JavaScript
        - A-frame
        - Web sockets
    - C++ (for the SensorTile)

a. include a GitHub repository

- Github Repo: https://github.com/anthony-mancini/dgmd-s-14-project

- GoogleDoc: https://docs.google.com/document/d/1IQhURf2v3RSsS2jgiLTDIsUIKxi3yYJ78XS6La-NhQg/edit?usp=sharing

b. any other tools? (example: dropbox, google drive, slack, google collab, etc.)

- Google
    - Google Drive
    - Google Docs
- Skype

5. Hardware used:

- STM SensorTile
- STM Nucleo Board (to interface with the SensorTile)
- Glove (to mount the SensorTile on)
- Rubik's Cube (to emulate a similar cube in VR)

6. Team Meeting Schedule: (tentative hours to meet with your team every week)

2-4 Hours per week on Skype, with email communications

7. List of Milestones, week by week:

Example:

- **Week 1.** Setting up a laptop, developing environment, start tutorials.
- **Week 2.** Download and set up Anaconda and learn some data analytics.
- **Week 3.** More tutorials and data analytics, project ideas and team building.
- **Week 4.** Collect Training data with SensorTile and design VR and communication software.
- **Week 5.** Collect Training data with SensorTile mounted on glove and data analytics.
- **Week 6.** Testing data with SensorTile mounted on glove and data analytics.
- **Week 7.** Final testing and data analytics, prepare presentation.
- **Week 8.** Project Presentation

8. Other comments:

Given the scope the project will be using a wide variety of cutting edge technologies and will be drawing broad conclusions that others can use in the future when creating their own VR applications, we believe that this will be an excellent project for the course at both undergraduate and graduate level and believe that it will be an excellent learning experience for us.