This document provides roles for members of C-ALL. All roles will coordinate and communicate with respective members as defined. When communicating with members of roles, you will communicate with them as per defined. Ex: Testers should communicate with the Modification request board, and the board will communicate changes to the team. Strict following of this will be required, as the deeper we proceed with the project the more complicated it will become and having everyone doing several parts at once will be difficult. So the modification board will be aware of everyone's situation and will assign roles when it is necessary, and members currently in progress with another role are not overwhelmed.

Development Lead (Ahmad Shah):
Responsibility: Oversee development and lifecycle

Buildmeister (Sohan Chatterjee):
Responsibility: Ensures seamless program integration amongst teams
Description: Make sure programs and tools used by **Developers** are able to effectively transfer data and communicate without having software issues. Ex: make sure everyone is using the same python version, document necessary packages used and is required for each program to run in program documentation as an "install executable" (basically you can make a script to automatically download required pip installs so people in a team don't need to worry about having the right versions for each software, I forgot the file program name, but I'll send you documentation to use it later when we are well into the development phase.) You will also handle battery and power distribution to systems created by **Ahmad Shah (Developer) and Sara Gaber (Developer).**

Architect (Sara Gaber):
Responsibility: Design overall system structure
Description: You will ensure that the architecture of the system and tools used fits the project's needs. We are trying to make it cost effective, when other **Developers** use packages to make their respective projects, you will find alternatives that would be more efficient. Ex: a package that runs on a pc may run fine, how would the efficiency be translated to a raspberry pi, find packages that would be better used for the raspberry pi and instruct developers accordingly.

Developers (Ahmad Shah, Sohan Chatterjee, Sara Gaber):
First Development Phase:

Ahmad Shah: Utilize Lidar Sensor and create 3D point map, and translate to simplified 3D objects.

Sohan Chatterjee: Acquire access to Lidar sensor from Stevens, research appropriate viewfield of lidar sensor (what would be optimal, do we need to see items on the floor, how much to the floor should it see, how high should it see, how are you going to tackle user height) find papers or articles, site resources and explain in depth for reasoning. You will then join Ahmad Shah in development of Lidar Sensor Usage once requirements have been stated.

Sara Gaber: You will create the interactive glove interface, the method of translating the information to the user will be up to your discretion (electromagnet idea implementing the ball was just my initial thought, there was no research on other methods). Ahmad Shah's program will send you an x, y coordinate on a 2D grid, your program will by a class that takes in an x,y coordinate and translates the information to your glove (try using arduino nano as the processor to keep costs down)

Test Lead (Sohan Chatterjee):
Responsibility: Lead Testing Team

Testers (Sohan Chatterjee, Neeti Mistry)
Responsibility: This team will focus on testing the applications developed by the developer team, you will find edge cases and apply stress testing, accounting for best and worst case scenarios, in addition you will analyze code to make it optimal and keep Big O as efficient as possible. You will coordinate with the **Modification Request Board**, appropriately .

Documentation (Ahmad Shah, Sohan Chatterjee, Sara Gaber, Neeti Mistry)
Documentation Editor (Neeti Mistry):
Responsibility: Add substance, detail, and demonstrative graphs of documentation and enhance report quality

Designer (Sara Gaber):
Responsibility:

1. You will design the structure and design of the glasses and glove, focusing not only on functionality, but style and option variability (Ex: colors scheme for glasses (lidar and frame) and gloves, physical designs on them), you will create designs on solidworks, and will focus on design later in development, as a base structure will be needed for testing.
2. You will create a front-end website showcasing the product (we will omit backend function), requirements will be provided by **Requirements Resource.** Ahmad Shah will join you in this endeavor. You will instruct him on required designs for your vision.

User advocate (Neeti Mistry):
Responsibility: Represent the end user and their desires and needs, find flaws with the products and discover improvements.

Risk Management (Neeti Mistry):
Responsibility: Identify risks with the project and risks with marketability and current competitors. Find how to make the product more appealing or unique, coordinate with **Sara Gaber (Designer)**.

- Project Risks
    - Technical Challenges:

        - Risk: Integration of LiDAR sensors, haptic feedback, and mobile application may face technical difficulties, including compatibility issues and data processing limitations.
        - Mitigation: Conduct thorough testing and iterative development to address technical issues early. Collaborate with experts and use proven technologies to minimize integration risks.
    - User Experience Issues:
        - Risk: The product may not meet user expectations or may be difficult to use, leading to poor adoption.
        - Mitigation: Engage in continuous user testing and feedback collection throughout the development process. Prioritize user-centered design principles and iterate based on feedback.
    - Cost Overruns:
        - Risk: The project may exceed budget due to unforeseen expenses or technical difficulties.
        - Mitigation: Develop a detailed budget with contingency funds and monitor expenses closely. Regularly review and adjust the budget as needed.
- Marketability Risks
    - Market Adoption:
        - Risk: There may be limited adoption of the product if it doesn't align with market needs or lacks sufficient awareness.
        - Mitigation: Conduct market research to understand user needs and preferences. Develop a targeted marketing strategy to raise awareness and demonstrate the product's value.
    - Competitive Landscape:
        - Risk: Existing competitors may offer similar or superior products, affecting your product's marketability.
        - Mitigation: Analyze competitors' strengths and weaknesses. Identify and emphasize unique selling points and areas where your product provides additional value.
    - Pricing and Accessibility:
        - Risk: The product may be priced too high for the target market, limiting its accessibility and adoption.
        - Mitigation: Conduct pricing research to find an optimal price point. Consider offering different pricing tiers or subsidies for users with financial constraints.
- Enhancing Appeal and Uniqueness
- Unique Features:
    - Incorporate unique features that differentiate your product from competitors, such as advanced haptic feedback customization, integration with other smart devices, or enhanced environmental mapping.
- User-Centric Design:
    - Focus on intuitive design and ease of use to ensure a seamless user experience. Provide customization options for different user needs and preferences.

System Administrator (Ahmad Shah)
Modification Request Board (Ahmad Shah, Sara Gaber):
Sara Gaber: Will oversee requests from all roles and will document requests, and implications, as well as how it would affect project development from other roles. In decisions that may be sensitive or would affect the project as a whole, communicate with Ahmad Shah (Modification Request Board)

Requirements Resource (Neeti Mistry)
Customer Representative (Sohan Chatterjee, Neeti Mistry)