# Smart Glasses Integration: A Project Outline

This document details the project outline for integrating a smart Glasses system with advanced QoL features, leveraging cutting-edge technologies to enhance user experience and functionality. The project will involve three main components: Computer Science (CS), Artificial Intelligence (AI), and Engineering. Each section will address specific requirements and desired functionalities.

## 1. Computer Science

### Dashboard (Dark-Mode)

- **States of Devices**
  - Monitor and display the current status of devices: ON, OFF, MALFUNCTION, RUNNING.
- **Manual Control**
  - Implement on-site control buttons and dedicated pages for device management.
- **Connected Devices / Home Appliances**
  - Facilitate the connection and disconnection of devices and controllers (e.g., Bluetooth module).
  - Provide detailed device information and usage statistics.
- **Usage Statistics**
  - Analyze and display data on the most frequently used commands and comprehensive home appliance information.

### Advanced Features

- **Basic AR Mobile Experience**
  - Explore the potential for an augmented reality interface to enhance user interaction.
- **Basic Meta-Quest / Holo-Lens Functionality**
  - Investigate the integration of advanced AR/VR systems for improved user engagement.
- **Communication Ports**

- ○ Establish input and output ports for seamless data exchange between phone and dashboard.

# 2. Artificial Intelligence

## Competitor Analysis

- Conduct in-depth analysis of existing smart home solutions to identify strengths and opportunities for improvement.

## Speech Recognition

- Implement Python-based speech recognition using libraries like Pillow for interface improvements.

## Computer Vision

- Develop a companion system utilizing OpenCV for advanced computer vision capabilities.

## Tool Manipulation

- Enable internet-based tool manipulation through gateway ports for remote operations.

## Data Analysis & Crave Prediction

- Utilize Python libraries such as Pandas, Matplotlib, and Seaborn for data analysis.
- Implement machine learning models for predictive analytics.

## Communication Ports

- Set up input and output ports to facilitate communication between glasses systems and mobile device.

## GPS Navigation

- Integrate GPS navigation systems for location-based functionalities.

# 3. Engineering

## Frame Body Creation

- Design the chassis using FreeCAD, ensuring it is aesthetically pleasing and within size constraints.

## Components and Modules

- Incorporate essential components such as speakers, microphones, cameras, HUD (Head-Up Display), microcontrollers (ESP32, Raspberry Pi), and infrared sensors.

## Wiring and Testing

- Establish a robust wiring system and conduct thorough testing to ensure functionality and reliability.

## Design Constraints

- Ensure the chassis is smart-looking, lightweight, and no more than double the size of standard glasses brands.
- Opt for CNC machining or 3D printing for chassis production, with specific guidelines for strength and aesthetics.

# Technologies Required

1. **Android Phone** (Mandatory)
2. **Android Studio** (Mandatory)
3. **Front-End Development** (React, etc.) (Your Choice)
4. **Back-End Development** (SQL, Firebase, GraphQL, etc.) (Your Choice)
5. **Python Libraries** (Mandatory)
   - Pandas
   - Matplotlib
   - Seaborn
   - AI/Machine-Learning/Deep-Learning Models
6. **Hardware** (Mandatory, Your Choice)
   - Microphone
   - Speakers
   - Camera
   - Acrylic or 3D Printer
   - HUD Projector
   - Small Microcontroller
   - Server
7. Docker (Mandatory)
   - Use Docker to streamline project deployment without setup hassles.

Notes

- All elements of this outline are subject to change and open to discussion.
- This is a foundational outline to guide the project's development and ensure all necessary components are considered.