Elder Care Monitoring Rover with Voice Assistant - Project Requirements

# 1. Project Requirements

🔹 The robot must monitor the elderly person using facial recognition and voice assistant.

🔹 The robot should remind the elderly person of their medication schedule and ensure adherence.

🔹 If the elderly person does not respond or shows signs of distress, the robot must notify family members via Discord or SMS.

🔹 The robot must support offline functionality for speech recognition and voice assistant capabilities.

🔹 The robot must place urgent phone calls (not just messages). For example:

• When the elderly says 'ambulance', the bot should call the designated emergency number.

• When they say 'firefighters', the bot should call the appropriate number.

• (See table below for mapping)

| Audio Command | Number to Call |

|---------------|----------------|

| ambulance | [Ambulance No.]|

| firefighters | [Firefighters No.]|

🔹 The elderly can say: 'I will sleep for 2 hours. Wake me up.'

• The robot must set an alarm and attempt to wake the user after the specified time.

• If unable to wake the user, the bot should notify a family member or emergency contact.

🔹 The elderly can say: 'Remind me of that on [date and time].'

• The bot must store the reminder and keep reminding until the elderly says 'got that.'

# 2. Hardware and Tools

- Raspberry Pi 4 (4GB/8GB): Main controller and processor

- Pi Camera Module: Facial recognition and video feed

- Microphone Module: Voice assistant and speech recognition

- Speaker Module: Voice assistant output

- Motor Driver (L298N): Controls wheels

- Wheels & Chassis Kit: Mobility

- Battery Pack: Power supply

- Ultrasonic Sensors: Obstacle detection

# 3. AI Models and Libraries

- Facial Recognition: dlib + OpenCV

- Speech Recognition: Vosk (offline)

- Wake Word Detection: Picovoice Porcupine

- Text-to-Speech: eSpeak

- (Optional) Conversational Assistant: Mycroft AI or Rasa