PANIC-CARE AI

ZUNNURAIN AZAM

4473-FBAS/BSCS/F21

Section A

MUHAMMMAD USAID ABID

4467-FBAS/BSCS/F21

Section A

Supervised By

Department of Computer Science
International Islamic University (IIU) in Islamabad

14 MAY 2025

Contents

1. Introduction

Emergencies often trigger panic, especially when people lack proper knowledge of basic first aid. Immediate and informed responses can save lives in common incidents like burns, cuts, choking, or fainting etc. This project proposes an AI-powered first aid assistant that uses LangChain and Retrieval-Augmented Generation (RAG) to provide real-time, situation-specific, and medically reliable advice through a conversational interface. Users will be able to describe a situation in plain text or voice, and receive actionable guidance instantly.

2. Objectives

- To design an intelligent assistant capable of providing accurate first aid guidance using AI.
- To leverage LangChain and RAG to retrieve relevant medical content from curated sources.
- To make the assistant user-friendly and accessible for non-technical individuals.

3. Problem Description

In medical emergencies, the average person either panics or lacks the proper knowledge to act effectively. Conventional first aid apps are static and do not account for the real-time context of the situation. This leads to delays or incorrect actions that can worsen the patient's condition. Furthermore, most apps do not allow for flexible or natural user input. This project aims to overcome these gaps by using AI (LLMs + LangChain + RAG), which retrieves updated information from trusted sources (like Red Cross, WHO documents) and interacts intelligently with the user to guide them step by step through a first aid scenario.

4. Methodology

The system will be built using LangChain to orchestrate the flow between user input, document retrieval, and LLM output. First aid manuals and documents will be indexed using vector embeddings with a vector database (Chroma/FAISS). Upon receiving a query, relevant content will be retrieved (RAG) and passed to a pretrained language model to generate an accurate, readable response. The interface will be developed using React integrated with text , speech recognition and TTS APIs for voice support.

5. Project Scope

The assistant will support major first aid situations (burns, bleeding, choking, fainting, etc.). It will not handle diagnosis, medication advice, or replace professional medical consultation. Initially, only English-language queries will be supported. Voice assistance is also included in it . The system assumes access to a reliable internet connection and hosted LLM .

6. Brief Feasibility Study

i. Risks Involved:

- Limited training with LangChain and RAG (can be mitigated with tutorials and documentation).
- Voice integration complexity .

ii. Resource Requirements:

- Access to LLM .
- Basic laptop with internet - Python development environment - React environment.
- Free tier vector DB (Chroma/FAISS)

7. Solution Application Areas

- Healthcare for the general public
- Schools and institutions for awareness training
- Field workers and outdoor professionals
- Emergency preparedness tools for travelers and remote area workers

8. Tools/Technology

- Python
- React
- LangChain
- LLMs
- Chroma / FAISS
- Google Speech-to-Text
- TTS libraries

9. Expertise of the Team Members

Both team members have foundational knowledge of Python and basic AI/ML concepts. We have recently explored LangChain and are in the process of learning RAG architecture. The project aligns with our interests and career goals in applied AI.

10. REFERENCES:

1. "First Aid Manual by Red Cross". www.redcross.org. Last accessed April 2025.
2. LangChain documentation. https://docs.langchain.com
3. RAG documentation – https://python.langchain.com/v0.2/docs/tutorials/rag/
4. WHO Guidelines – https://www.who.int/home

ADDITIONS BY COMMITTEE:-

1. Mobile Application Module
2. Doctor Regesteration Module