Rajasthan Technical University

Kota

Department Of Computer Science Engineering

Project Synopsis

Topic: Lumen

Submitted to:

Dr. CP Gupta
Department of Computer Science

Submitted by:

Anish Soni (21/ 189)

Diggaj Bishnoi (21/ 422)

Gaurav Purohit (21/ 428)

Karikeya Soni (21/ 236)

Project Synopsis: "Lumen"

Introduction:

In the age of Artificial Intelligence and wearable technology, the demand for innovative solutions that seamlessly integrate into our daily lives is ever-growing. "Lumen" is a groundbreaking AI wearable device developed during the MHacks hackathon at Google. Leveraging the power of Gemini 1.5 Pro, Lumen aims to revolutionize how we interact with and retain information from our surroundings. By combining AI with real-time audio and visual inputs, Lumen provides users with instant answers to their questions based on what they see and hear and even creates a persistent memory of these interactions.

Lumen: Conveys the idea of light and clarity, reflecting the device's ability to shed light on information and provide clear insights.

Problem Statement:

In a world where information is abundant yet fleeting, retaining and retrieving context-specific knowledge from our daily experiences can be challenging. Current technology solutions are limited in their ability to provide real-time, context-aware information processing and memory retention, especially in a wearable form. Lumen addresses these gaps by offering a portable, AI-driven solution that enhances human cognition and memory by leveraging the latest advancements in artificial intelligence.

Objectives:

- To develop a wearable AI device capable of processing and responding to real-time visual and auditory inputs.
- To integrate Gemini 1.5 Pro AI into the device for advanced natural language processing and context-aware responses.
- To create a memory system that stores and recalls interactions, providing users with a digital extension of their memory.
- To ensure seamless user experience with real-time answers to questions based on what the user sees and hears.

Scope:

The scope of this project includes:
- Hardware Integration: Designing and assembling the wearable device using a Raspberry Pi and integrating necessary sensors (camera, microphone).
- AI and Machine Learning: Implementing Gemini 1.5 Pro AI for processing visual and auditory data and generating context-aware responses.
- Memory Storage: Developing a system for storing and recalling data based on user interactions, allowing the wearable to act as an external memory device.

- User Interface: Designing a simple and intuitive interface for users to interact with the wearable device.
- Performance Optimization: Ensuring the wearable device operates efficiently, with low latency and high accuracy in response generation.

Current Tools & Their Limitations:

- **Smartphones**: While smartphones can process visual and auditory data, they are not always available or convenient for real-time, hands-free interaction.
- **Voice Assistants** (e.g., Siri, Alexa): These devices provide auditory information retrieval but lack the integration of visual inputs and memory retention capabilities.
- **AR Glasses**: Some augmented reality devices offer real-time data processing but often lack the sophistication in natural language understanding and memory storage that Lumen provides.

Proposed Solution:

Lumen is an AI wearable that will:
- Integrate AI with Wearable Technology: Bringing advanced AI capabilities directly into a wearable form factor.
- Real-Time Contextual Responses: Provide answers to questions based on what the user sees and hears in real time.
- Memory Retention: Create a persistent, searchable memory of interactions, enabling users to recall past experiences effortlessly.
- Portable and User-Friendly: Ensure the device is lightweight, easy to use, and comfortable to wear for extended periods.

Features:

- Visual and Auditory Input Processing: Captures and analyzes what the user sees and hears using integrated sensors.
- AI-Powered Responses: Utilizes Gemini 1.5 Pro for generating intelligent, context-aware responses.
- Memory Creation: Stores user interactions in a digital memory that can be accessed and searched later.
- Seamless Integration: Designed for ease of use with minimal setup and maintenance.

Technologies and Tools:

- Hardware: Raspberry Pi, camera module, microphone, battery pack.
- AI and Machine Learning: Gemini 1.5 Pro for natural language processing and context recognition.
- Software Development: Python for backend processing, integration with Raspberry Pi.
- Data Storage: Local and cloud-based solutions for storing interaction data.
- User Interface: Minimalist design focusing on voice and visual feedback.

Impact:

Lumen represents a significant leap forward in wearable AI technology, offering users an unprecedented level of interaction with their environment. By providing real-time, context-aware answers and creating a digital memory of experiences, Lumen enhances cognitive functions and memory retention. This technology has the potential to revolutionize fields such as education, work, and personal life by providing users with a powerful tool for learning, productivity, and everyday convenience.

Conclusion:

"Lumen" is not just a wearable device; it is a glimpse into the future of human-AI interaction. By combining cutting-edge AI technology with wearable form factors, Lumen offers a seamless, intelligent, and personalized experience that empowers users to engage more deeply with their world. This project showcases the potential of AI in augmenting human capabilities, providing a bridge between technology and the natural human experience.