Software Requirement Specifications

LIVE LECTURE VISUAL GENERATION

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1. Introduction

1.1 Purpose

The purpose of this document is to provide a detailed description of the requirements for the development of a system that recognizes the lecturer's voice and generates effective visuals in real-time. The aims to address the challenges faced by students in traditional lectures by enhancing engagement and understanding through interactive visual representations.

1.2 Scope

The scope of this project includes the development of a system that utilizes natural language processing (NLP) techniques and graphical tools like Canvas. The system will be capable of converting live voice into visuals, thereby providing students with a more interactive learning experience. The project will involve user testing, analysis of student engagement, and evaluation of learning outcomes to assess the effectiveness of the assistant.

2. Overall Description

2.1 Product Perspective

The system will be a standalone system designed to integrate with existing lecture delivery platforms. It will receive live audio input, process it using NLP algorithms, and generate real-time visuals based on the lecture content.

2.2 Product Features

1. Voice Recognition:

The system will recognize the lecturer's voice to differentiate between speech and other audio sources.

2. Content Understanding:

The system will utilize NLP techniques to understand the lecture content and identify key concepts.

3. Real-time Visual Generation:

Based on the recognized voice and content understanding, the system will generate relevant visuals in real-time.

4. Interactive Visuals:

The generated visuals will be interactive, allowing students to explore and engage with the lecture material.

5. Integration:

The assistant will integrate seamlessly with existing lecture delivery platforms to facilitate easy adoption and usage.

2.3 User Classes and Characteristics

1. Lecturers:

They will use the system as a tool to enhance their lectures by providing visual aids in real-time.

2. Students:

They will benefit from the interactive visuals generated by the system to improve engagement and understanding.

2.4 Design and Implementation Constraints

1. The system should utilize efficient algorithms and techniques to ensure real-time response and minimal processing delays.
2. The visual generation should be compatible with different screen sizes and resolutions to accommodate various devices.

2.5 Assumptions and Dependencies

1. The system assumes that lectures are delivered in a clear and understandable manner.

2. The system depends on the availability and quality of audio input during lectures.

3. Functional Requirements:

3.1. speech Recognition:

The system should understand the lecturer’s voice and present it as a text.

Input : lecturer’s voice

Process: recognize the lecturer’s voice using speech recognition

Output: lecturer’s voice in text format considers as a lecture

3.2 text Processing:

The lecture text should be process and converted in a way to represent data that could be understand by the system.

Input: lecture

Process: using the NLP techniques the lecture will be represented as a structure of classes with mapping to the data provided by lecture

Output: data in a data representation format

3.3 data representation format

The data representation format that is considered in this project will be hierarchy of class as follows:

Shape –> edge and angles -> points

3.4 canvas Visualization

The data from data representation format will be visualized using the canvas tools in python.

Input: data from data representation

Process: converts the data into visualization and show it in screen

Output: a canvas visual representation

3.5: Interface:

The interface contain the canvas and additional tools such a objects created so far which will be pointing to the represented data in the canvas and can be used to manipulate the canvas for more understanding

4. Non-functional Requirements

4.1 Performance

1. The assistant shall provide real-time visual generation with minimal processing delays.
2. The system shall handle a large number of concurrent users without significant performance degradation.
3. The response time for voice recognition and visual generation should be within acceptable limits.

4.2 Usability

1. The system shall have an intuitive and user-friendly interface for ease of use.

2. The system shall provide clear instructions and guidance for both lecturers and students.

5. Testing and Evaluation

5.1 User Testing

User testing will be conducted to evaluate the effectiveness and usability of the assistant. Lecturers and students will participate in real-world scenarios, providing feedback and insights for further improvements.

5.2 Evaluation Metrics

The effectiveness of the system will be evaluated based on:

1. Student engagement levels during lectures.
2. Improvement in student comprehension and understanding of lecture Material

6. Conclusion

This Software Requirements Specification (SRS) document outlines the detailed requirements for the development of the system that recognizes the lecturer's voice and generates effective visuals in real-time. This System aims to enhance engagement and understanding in lectures by providing interactive and visually stimulating experiences for students. By adhering to the defined requirements, the project aims to revolutionize the delivery and reception of lectures in ICT-based education, paving the way for new and innovative teaching methods.