Speech assistant

General project overview

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Introduction

Speech Assistant is a mobile web-oriented application designed to help users improve their pronunciation, emotional expression, and manage performance anxiety for public speaking events. The app offers interactive tools to practice various emotional tones, receive personalized speech clarity feedback, and monitor stress levels through wearables. By integrating a calendar for tracking public speaking events, the app also provides pre-event meditation and post-event stress management exercises, aiming to manage presentation-related stress.

Maryna

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For "stress management calendar"

01

Features Overview

which offers our application

Must–have features

Registration and login

To save progress

Emotion imitation exercises

To practice conveying emotions in an adequate manner

Calendar integration

To add events, after which the app would prompt to review user's thoughts

Analytics from exercises

To see improvement over time and with which emotions the user struggles the most

Maja

Should–have features

Personalized relaxation techniques

To help calm down before presentations; personalized – the ones that work the best for the user (reviewed after events)

Stress analytics

To see improvement over time and which relaxation techniques work best

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Could-have features

Smartwatch integration

To monitor stress levels (through heart rate) during events

Setting goals

For better motivation (e.g: reduce heart rate spikes to below 110 bpm, decrease stress levels by 10%, etc)

Maja

02

Speech Training

to help users improve their pronunciation, emotional expression

How it works?

01
User choose an audio recording with a specific emotional tone (e.g., joy, sadness, confidence, frustration).

02
User record the audio with pronouncing text, attempting to reproduce the given emotion.

04
The application provides feedback on how well the user's voice matches the intended emotion and offers tips for improvement.

03
The system analyzes the emotional tone of the user's recording using natural language processing and audio analysis technologies.

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03

Stress management

Relaxation methods based on which we will implement exercises to deal with stress

Relaxation methods

Diaphragmatic breathing

breathing into diaphragm while holding a hand on it.
– Special feature in app: visual "how to"

Mindfulness meditation

focusing on the breath while acknowledging and accepting passing thoughts.
– Special feature in app: timer

4 VII 8

4–7–8 method

breathing on a given pattern: four seconds for inhaling, seven seconds for exhaling, eight seconds for holding breath
– Special feature in app: countdown

Music meditation

focusing on the sounds and rhythms of different music pieces.
– Special feature in app: timer and playlist

Oliwia

04

Technologies & Tools

Which we will possibly use to develop the application

Emotion Detection and Response

OpenSMILE

An open-source audio analysis toolkit that can extract low-level descriptors (LLDs) like pitch, loudness, and tone, all of which are essential in emotional analysis.

PyAudioAnalysis

Library for audio processing that can handle feature extraction and emotion recognition with pre-trained models, or you can train your own model based on labeled emotional data.

Transformers (by Hugging Face)

Analysis models which can help in analyzing the emotional tone conveyed in text, which can aid in validating if the spoken tone matches the text's emotional intent.

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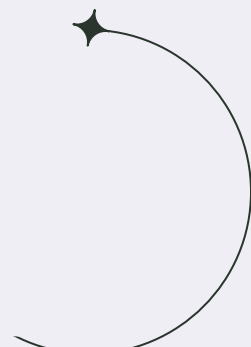
Back-end & Front-end

Front-end

React

As JavaScript user interface library that is used to build complex UI with great performance.

Back-end

Flask

As fast and simple Python web-framework. The best choice for small-medium size projects and prototypes.

Illia

More backend stuff

AWS Lightsail

Simplified cloud platform that provides virtual private servers, managed databases, and networking for easy and cost-effective deployment of small to medium-sized applications.

MySQL Database

Widely used open-source relational database management system known for its reliability, scalability, and support for structured data.

Illia

05

Calendar Implementation

Library for calendar

FullCalendar

FullCalendar is a versatile JavaScript calendar library that integrates seamlessly with React, offering interactive features like event scheduling, rescheduling, and multiple view options. Its customization options allow us to provide a user-friendly experience for tracking and managing public speaking events, making it a perfect fit for our app's event management needs

Nikola