TEAM -X

- VISHNU PRASAD B | 2027 | SRMIST
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Tell us a bit about yourself

Hi there! We have got a mixed bag of skills in software stuff, like making AD blockers and coming up with Web3 cloud storage. We also into cool robot research. We have done some hackathons too, tackling tricky problems with projects like the Dark Pattern Buster and Genesis 1.0. We love tech challenges and working with others to solve them!

Your selected problem statement

Today's generation is more concerned with physical fitness, which means overall well-being and the ability to perform a variety of exercises, be it high-level sports or typical daily tasks in IT. Mental health is also important, as it contributes significantly to overall well-being. Due to the demands of modern life, many people today face increased levels of depression, which can affect their physical and mental health. To address this, there is an increasing demand for products and programs that help individuals manage and track their physical and mental fitness. Recent statistics highlight the importance of mental health, with findings showing that 1 in 5 people in the country need mental health and psychosocial support, and that 45% of corporate workers have some form of mental health problem, which could get worse without them not focused enough.

Tech Stack

Backend: **TensorFlow, Keras , OpenCV**
Frontend: Not applicable (this script is for backend processing)
Cloud Service Providers: Not applicable
Database: Not applicable

Other Details:

- The script utilizes Keras and TensorFlow for deep learning model creation and prediction.
- OpenCV is used for image processing, particularly face detection.
- Matplotlib is used for generating graphs to visualize predictions.
- NumPy is utilized for numerical computations and array manipulation.

Detailed Description of the solution

Our proposed solution is based on the recommendation system designed to increase the user's psychological well-being. Here is a detailed explanation of our methodology:

1. Input Modalities: The system will accept input from users through two modes:

- Facial Expression: Users can submit images of their faces, using Computer Vision techniques with OpenCV. This analysis will exclude facial and emotional cues.
- Comment based sentiment analysis: Users can also post comments describing their thoughts or feelings. NLTK and other natural language processing libraries will be used to analyses and extract perceptual context from text.

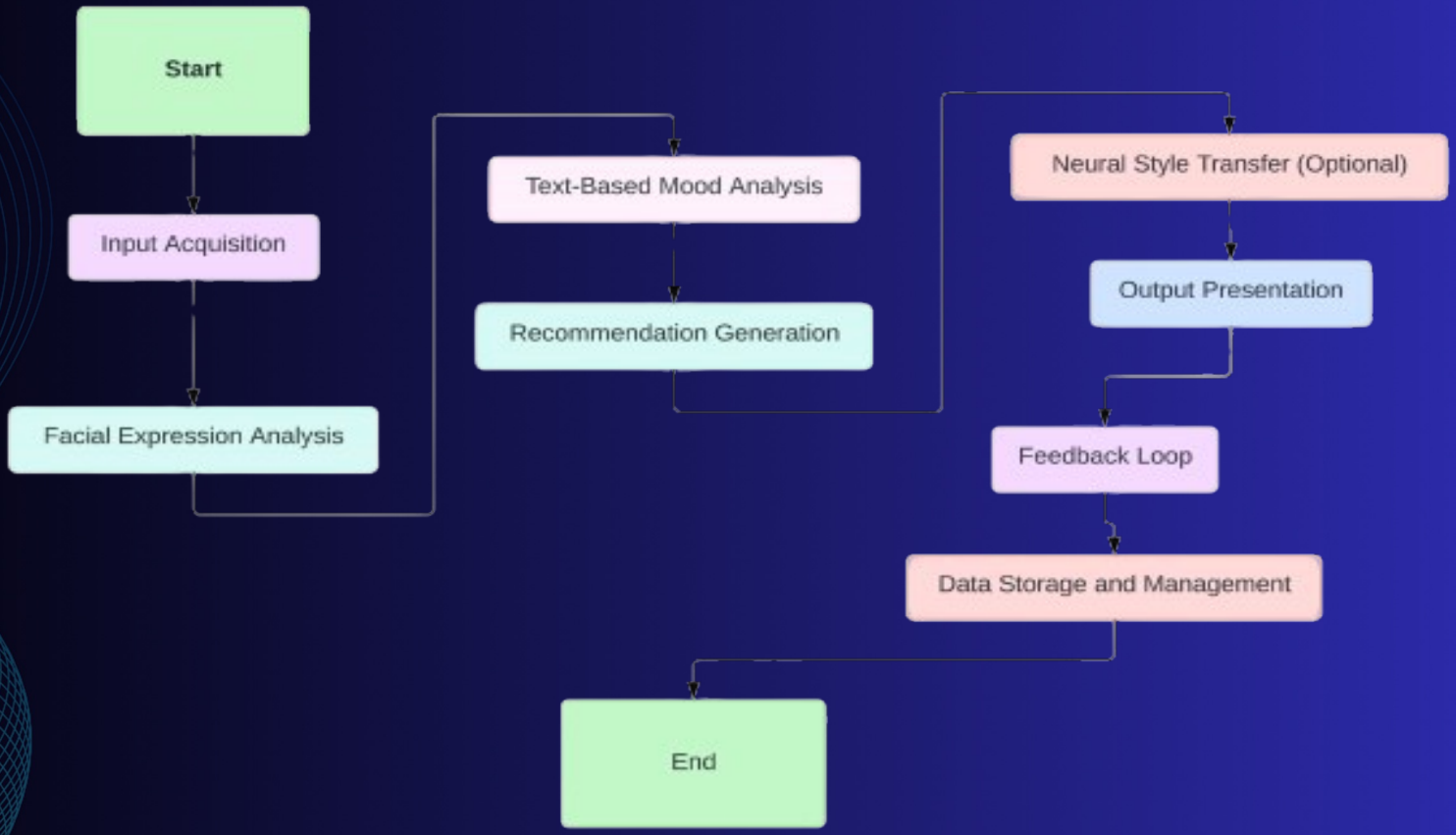
2. Emotion Recognition: Regardless of the user's selected input mode, the system uses advanced deep learning using systems like Keras to accurately recognize and interpret the user's emotional state . . . .

3. Neural Style Transfer: We plan to use Neural Style Transfer techniques to improve user engagement and experience. These techniques will apply an artistic trick to user-submitted images, turning them into something visually appealing. The OpenCV DNN module will be used for this.

4. Deployment Strategy: The entire system will be deployed as a Web Application using the Django framework. Django provides a robust and scalable platform for developing web-based applications. It ensures easy access across devices and platforms, allowing users to navigate the system seamlessly from their browsers.

Overall, our solution aims to provide users with suggestions and interventions tailored to their emotional state.

Data Flow Diagram



So, how is your solution different?

Multi-modal input: Our system accommodates facial expression analysis and information-based emotion analysis, allowing users to be flexible in how they communicate their emotions This multi-modal approach ensures that they will be included and available to many users.

Enhanced Emotion Recognition: Using state-of-the-art deep learning models for emotion recognition, our system can accurately interpret and understand the nuances of users' emotional state. This allows for more accurate and tailored recommendations and interventions.

Neural Style Placement for Visual Enhancement: The addition of neural style transfer techniques adds a unique visual element to the user experience. By turning user-submitted images into masterpieces, we increase engagement and encourage ongoing interaction with the platform.

Future possible enhancements

1. **Multimodal fusion**: Integrate facial expressions, text, voice, and gestures for comprehensive understanding.
2. **Personalization**: Customized recommendations based on user information and interaction history.
3. **Real-time feedback**: Dynamic change based on sensory analysis and physiological analysis.
4. **Field-specific knowledge**: Incorporating psychological principles for tailored interventions.
5. **Wearable Integration**: Using data from wearable devices to make contextual recommendations.
6. **Expanded Content**: Inclusion of a variety of media and mental health resources for a wide range of user needs.
7. **Collaboration**: Collaborate with mental health professionals to gain expert insight.
8. **User engagement**: Incorporating gamification elements to increase motivation and engagement.

Risks/ Challenges / Dependencies

1. **Data Privacy and Security**: Data users are protected and comply with the law.
2. **Algorithm Bias**: Bias reduction in the recommendation algorithm.
3. **Technological challenges**: Easy integration of different technologies.
4. **User adoption**: Encourages participation, especially among hesitant users.
5. **Scalability**: Ensure that the system can adequately meet the increasing demands of the user.

Acceptance Criteria Coverage

There are several key elements to the problem story:

1. Importance of physical and mental fitness in modern life.
2. Statistics on the prevalence of mental illness, especially among corporate employees.
3. A proposed approach to the problem, with a recommendation plan.
4. Features of recommendation systems, including input techniques (facial expression and text-based thinking), data processing techniques (computer vision, deep learning, including natural language processing), and recommendation sources (Last FM, IMDB).
5. Application scenarios where the system can provide support, such as during times of stress or distress, and its ability to recommend media to lift users' moods.

All these aspects are covered in the response.

Anything Else ?

One additional consideration to note is the potential impact and scalability of the proposed solution. While the focus is on addressing mental health challenges, the successful implementation of the recommender system could have broader implications for user well-being across various industries and demographics. Additionally, ensuring scalability and accessibility of the system will be crucial to reaching a wider audience and maximizing its positive impact on mental health. Regular updates and improvements based on user feedback and advancements in technology will also be essential to maintaining the system's relevance and effectiveness over time.

Team Member Details

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Team Member 2 Name: D.T.VANSHIKA

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Team Mentor Name: Saket

Category: Student

Domain Experience: 2nd year at SRMIST