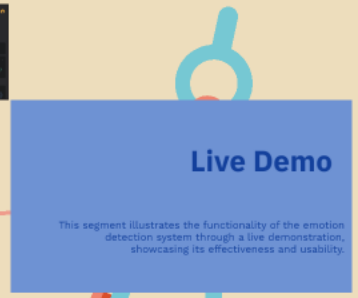
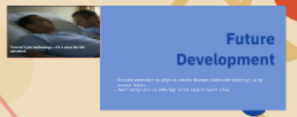
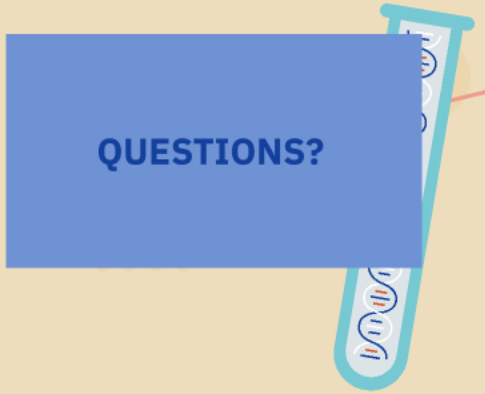
NeuroAura

Bridging the Communication Beyond Words







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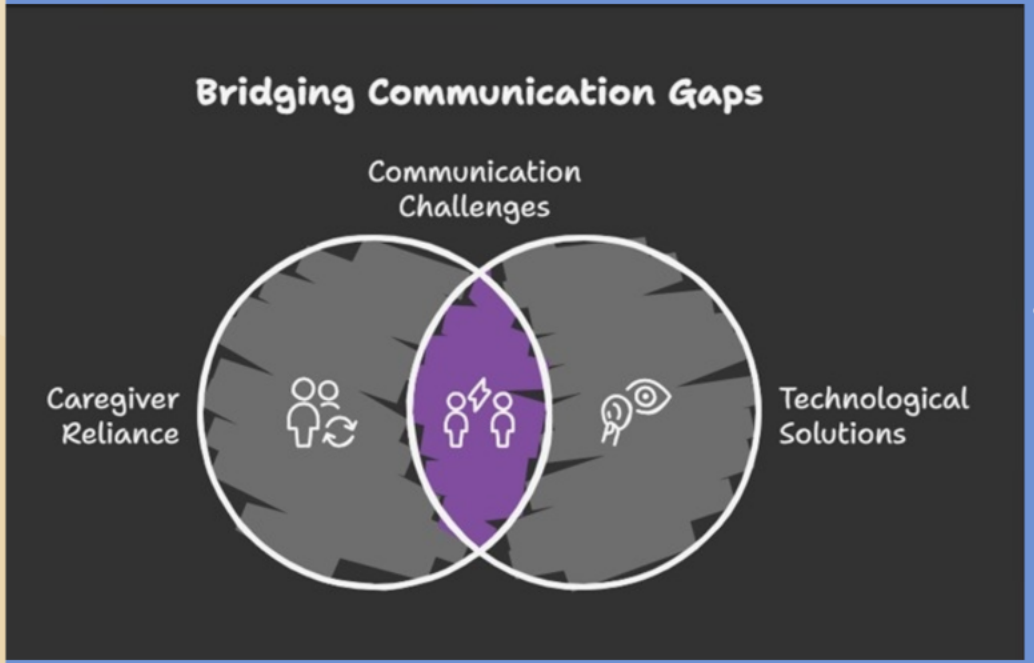
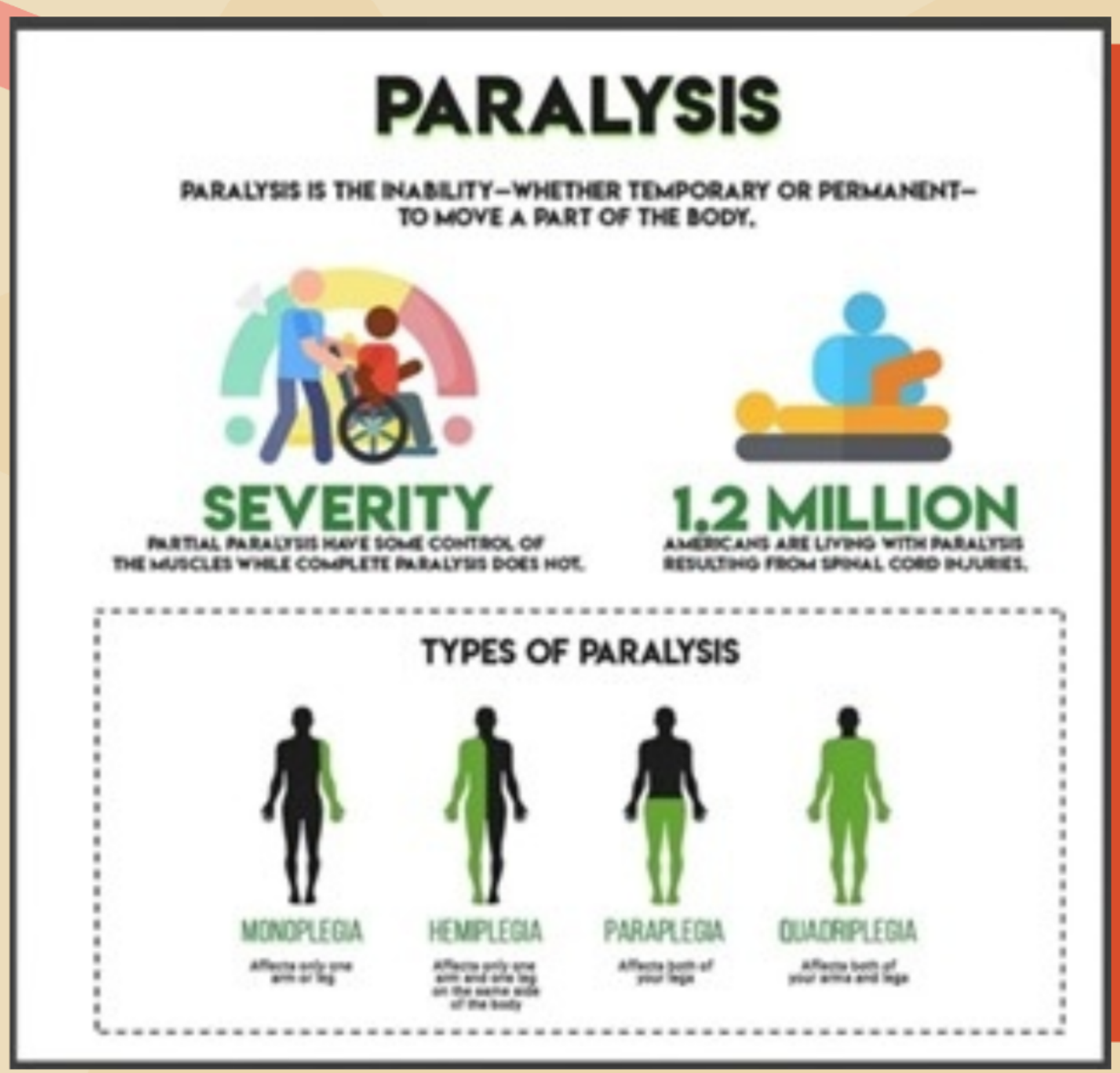
DO YOU KNOW?



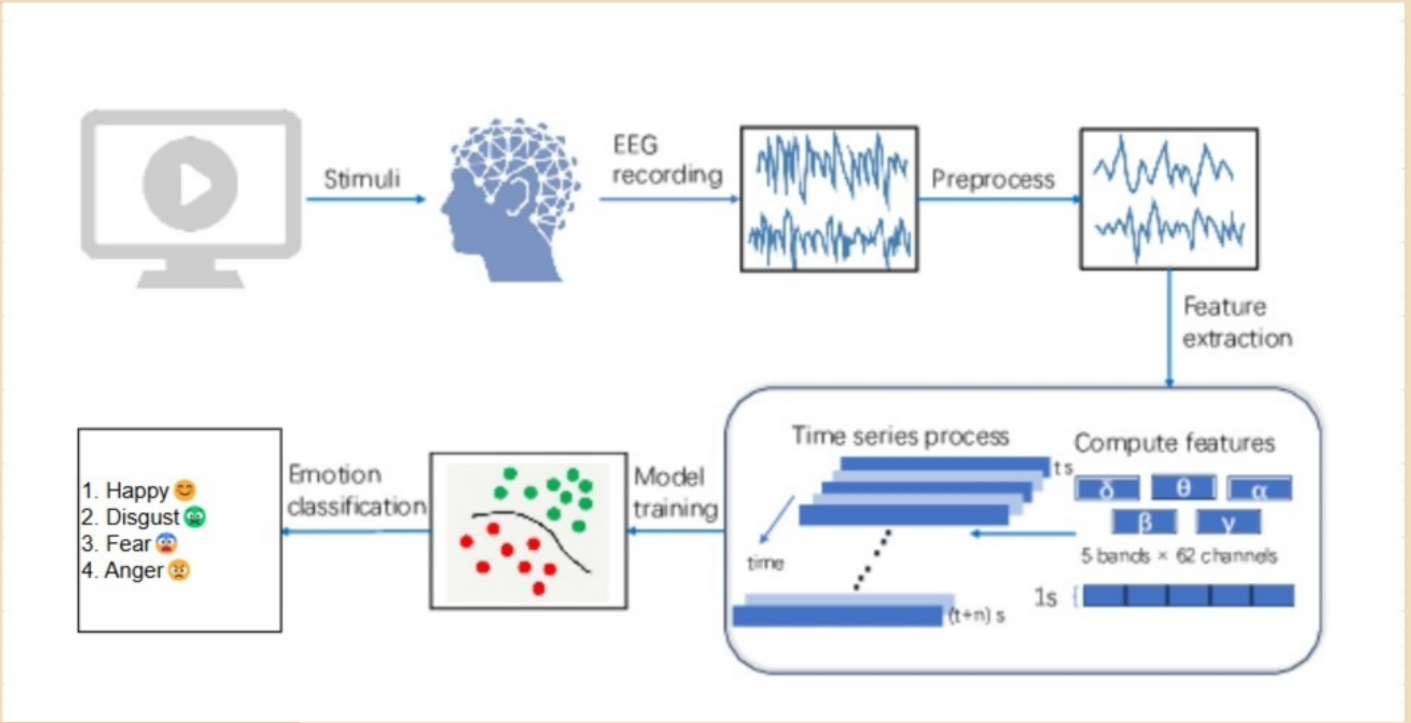
- Did you know that over 5 million people worldwide suffer from paralysis, losing the ability to express even basic emotions?
- Imagine being trapped in your own body, unable to tell your loved ones if you're happy, angry, or in pain. Today, we present a lifeline for these individuals: a real-time emotion detection system that bridges the gap between their inner world and the outside



Problem Statement

- 1 in 50 people globally lives with paralysis (Source: WHO).
- Paralyzed individuals rely on caregivers for basic communication, leading to frustration and emotional isolation.

Our Solution



The proposed solution is a non-invasive, AI-driven emotion detection system that identifies four core emotions (Anger, Disgust, Fear, Happy). This innovation aims to enhance communication and understanding for paralyzed individuals.

Impact

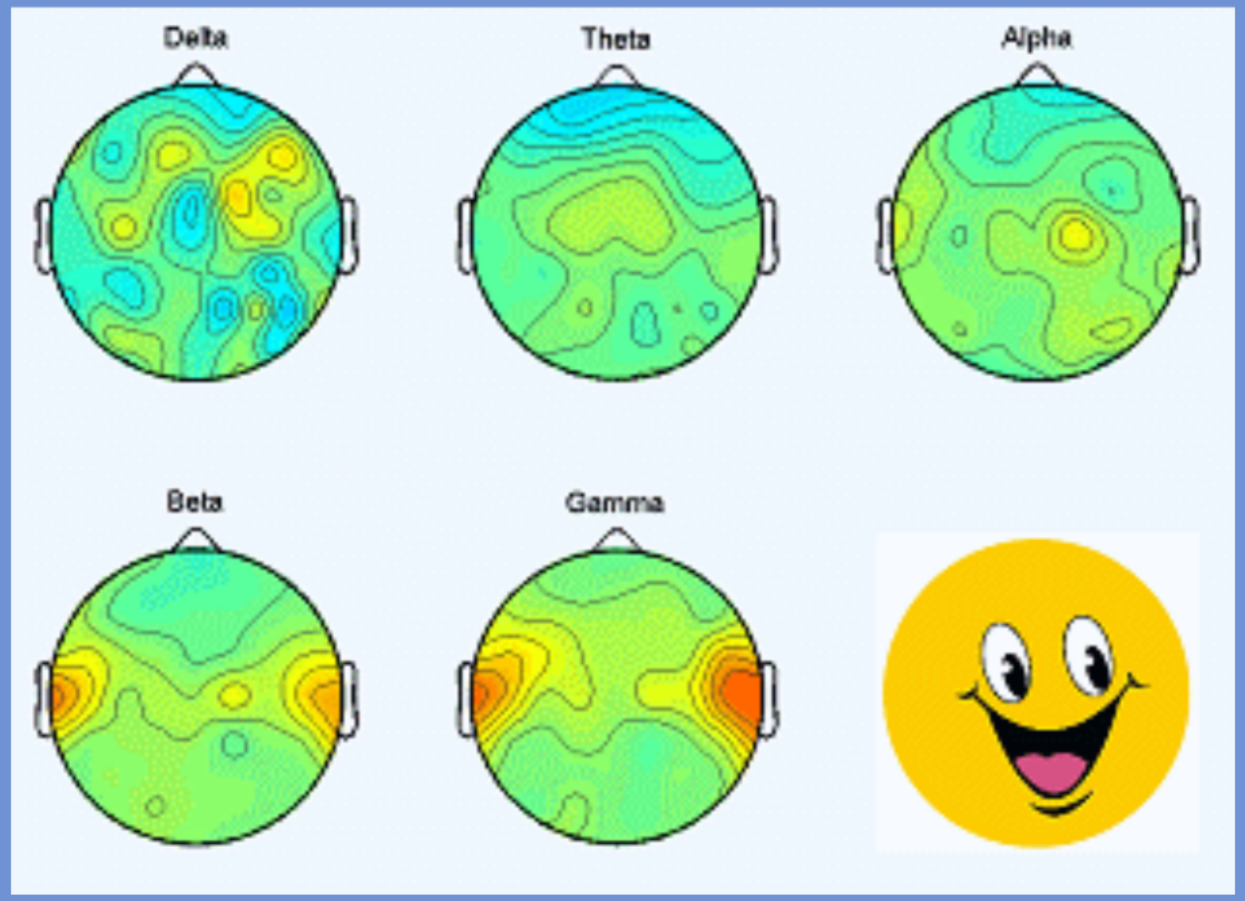
Empowers users to communicate emotions instantly.
- Reduces caregiver dependency, improving mental well-being and dignity.

Model Explanation

This section outlines the sophisticated model designed to detect emotions in paralyzed individuals, providing insights into the dataset used, the architecture of the model, and the results achieved.

Dataset

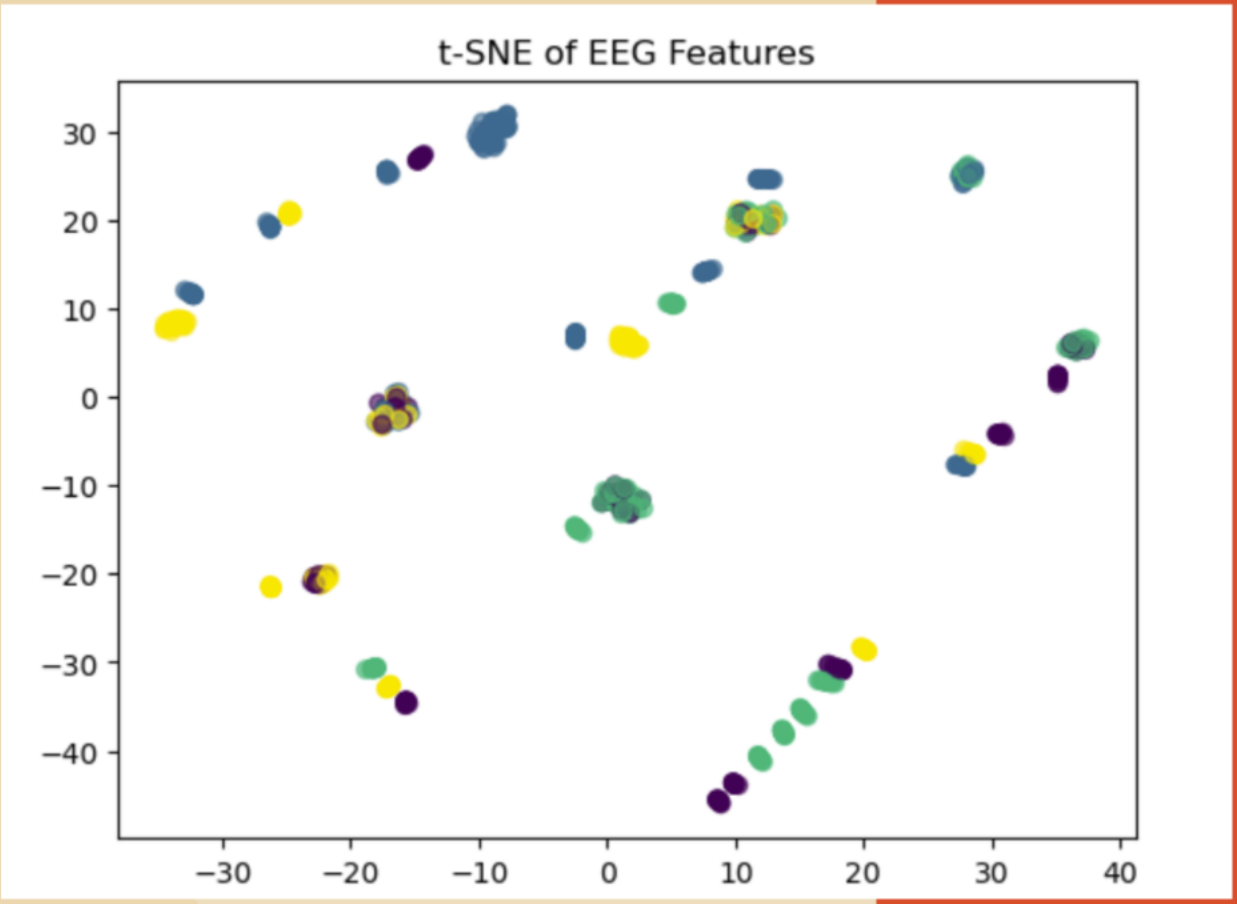
The model is trained on SEED VII, a multimodal dataset comprising EEG and eye-tracking signals sourced from 20 subjects. This diverse dataset is pivotal for capturing a wide range of physiological signals related to emotions, ensuring robust training and evaluation.



```python
#1D CNN + LSTM Architecture
model = Sequential([
    Conv1D(128, kernel_size=3, activation='relu', input_shape=(max_length, 310)),
    BatchNormalization(),
    MaxPooling1D(2),
    Dropout(0.3),

    Conv1D(256, kernel_size=3, activation='relu'),
    BatchNormalization(),
    MaxPooling1D(2),
    Dropout(0.3),

    LSTM(128, return_sequences=True),
    LSTM(64),

    Dense(128, activation='relu'),
    Dropout(0.5),
    Dense(4, activation='softmax')
])
```

Architecture

The model employs a 1D CNN combined with an LSTM hybrid architecture. The CNN component extracts spatial features while the LSTM component captures temporal patterns, essential for analyzing physiological signals over time, enabling accurate emotion classification.



WHY?

- Why Hybrid? Combines CNN’s feature extraction with LSTM’s sequence modeling for physiological signals.

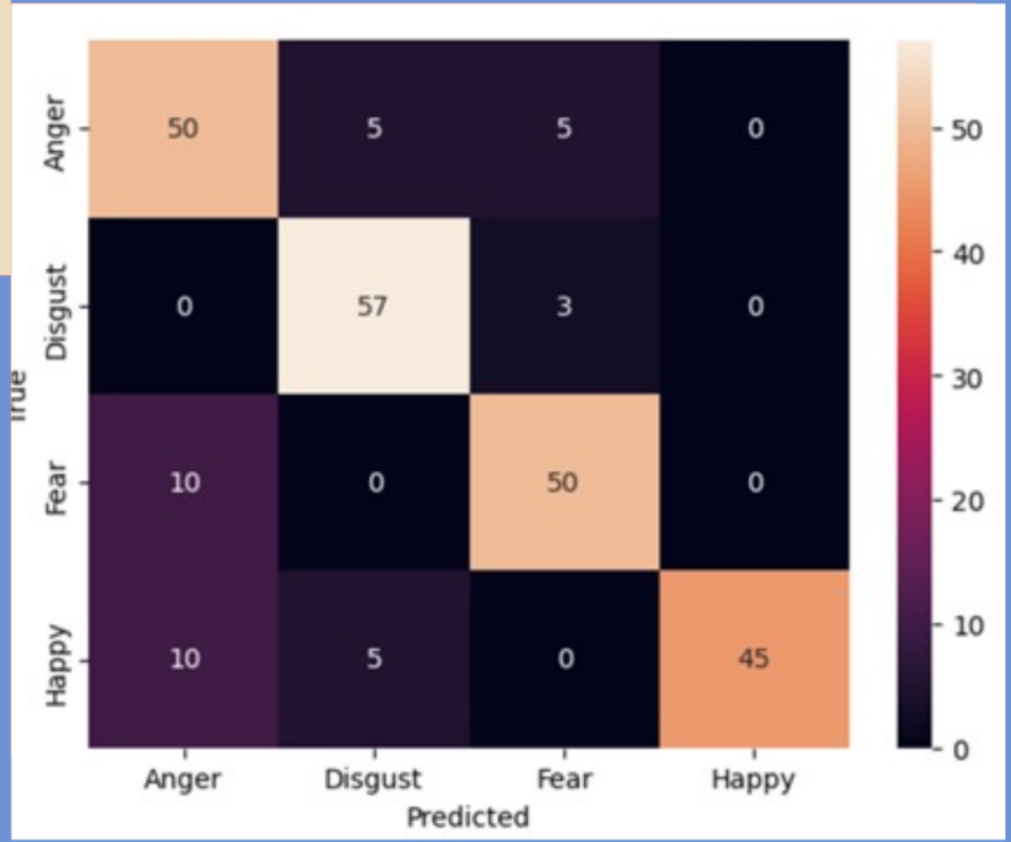
- To tackle the challenge of imbalanced data, especially with fewer instances of emotions like 'Fear', class weighting was implemented. This approach ensures that the model remains fair and does not bias towards more frequently represented emotions.

Results

The model achieved a remarkable test accuracy of 84.17%. Such high accuracy underscores the effectiveness of the model in accurately detecting the nuanced emotions of paralyzed individuals, opening doors for practical applications.

Test Accuracy: 84.17%

	precision	recall	f1-score	support
Anger	0.71	0.83	0.77	60
Disgust	0.85	0.95	0.90	60
Fear	0.86	0.83	0.85	60
Happy	1.00	0.75	0.86	60
accuracy			0.84	240
macro avg	0.86	0.84	0.84	240
weighted avg	0.86	0.84	0.84	240



App Design UI/UX

A seamless UI and robust backend are essential for effective emotion detection, ensuring users can easily interpret emotions in real time.

ALL
PAGES


Welcome to NeuroAura
AI healthcare in your hands!
Meet Neuro Aura
your digital health assistant
Communicating beyond words
Sign In
Sign Up
Sign In
Let's get started
Mobile Number
Email
Mobile Number
+1
Next
Sign Up
Let's Get To Know You
Fill details to continue
First Name
Last Name
Alex
Last Name
Mobile Number
+1
Email (optional)
AlexJohn@gmail.com
Gender
Male
Female
Other
Date of Birth (optional)
mm / dd / yy
Sign Up
Analyze
Emotions
Emotional status
HAPPY
Sleep status
Last 7 days
4/7
Achieved
TRENDS
How to check your emotion
Understanding and managing your emotions is essential for maintaining mental well-being and making better decisions.
Get started
How EEG works
It works by placing electrodes on the scalp, which detect tiny electrical signals generated by neurons as they communicate.
Get started
EEG on Youtube
Home
Journal
Browse
Profile
Notification
Yesterday
Sleep
4:50 PM
Emotion detected
11:46 AM
Emotion detected
9:30 AM
Emotion detected
Thu, Mar 13
Sleep
8:44 PM
Emotion detected
3:07 PM
Emotion detected
Wed, Mar 12
Sleep
9:17 AM
Emotion detected
Home
Journal
Browse
Profile
Sleep
Deep Sleep & Total Sleep
Last 7 days (Hours)
Sleep Stage Proportions
Last 7 days (Duration)
Bedtime & Wake-up Trends
Last 7 days
Profile
Alexander Arnold
Alexander Arnold@gmail.com
Activity
Sleep
Vitals
Nutrition
Notification
Home
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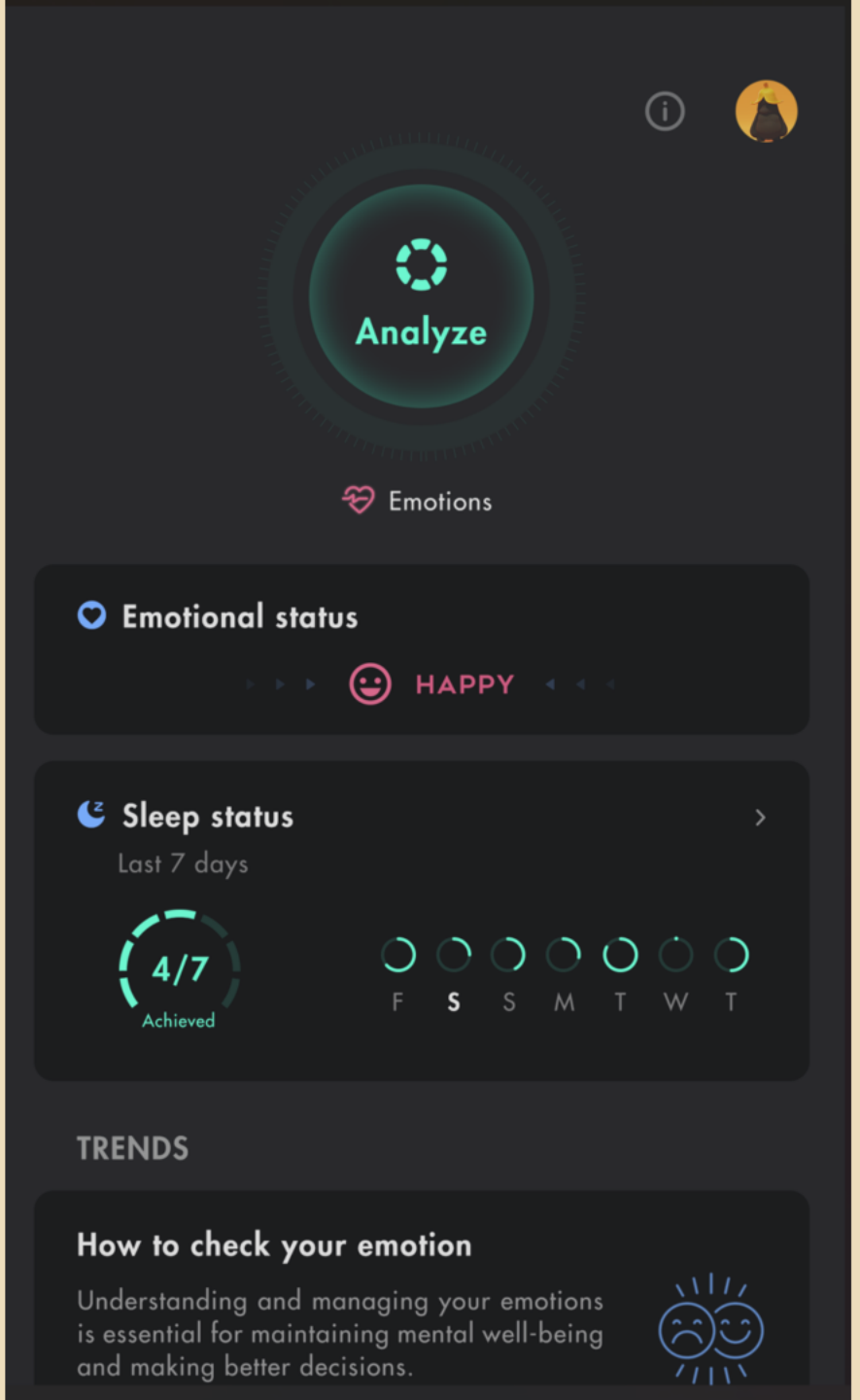
Browse
Profile

Live Demo

This segment illustrates the functionality of the emotion detection system through a live demonstration, showcasing its effectiveness and usability.

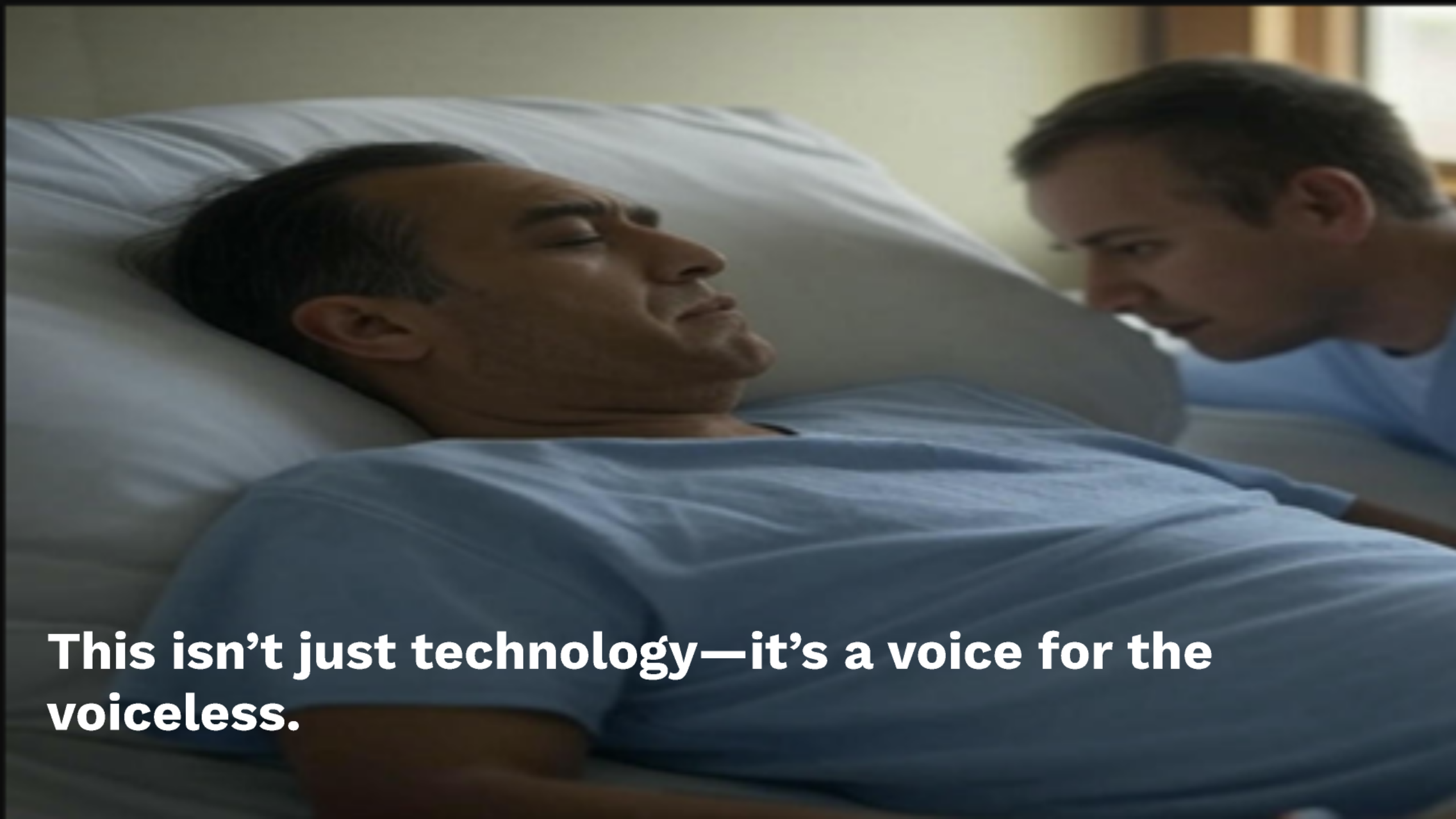
User Interaction Steps

- **User clicks "Analyze"** → Flask API simulates data from a paralyzed individual.
- **Result** "Anger detected" with a confidence score of 85%.
- **Dashboard Update** Logs the emotion and updates weekly trends.



Future Development

- Expand detection to physical needs (hunger, bathroom urgency) using sensor fusion.
- Alert caregivers via SMS/app when urgent needs arise.


This isn’t just technology—it’s a voice for the voiceless.

QUESTIONS?

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