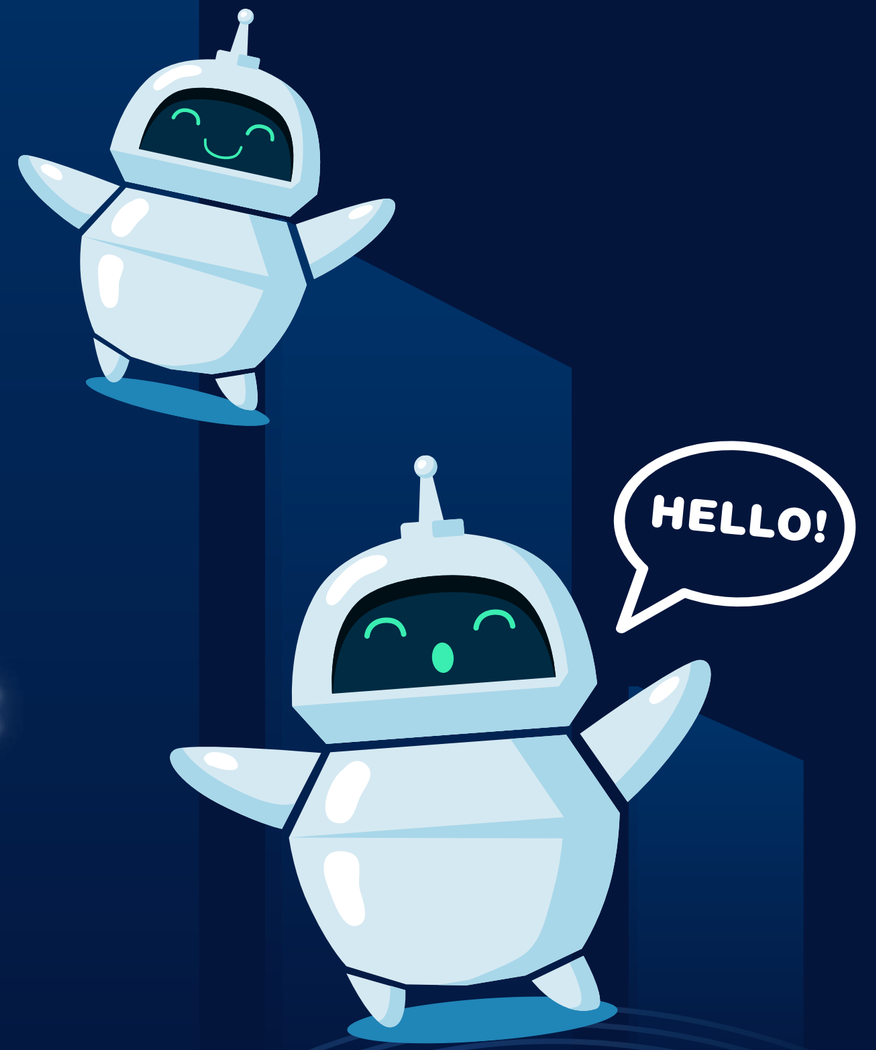
Presented By

UCE2023501 ADITI SARASWAT
UCE2023527 ANUSHKA GAVIT
UCE2023561 SHARVARI UGHADE

AI Memory Plan

Intelligent AI Diary For Alzheimer Patient



MKSSS's Cummins College of Engineering for Women, Pune
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Preserving Memories with AI-Powered Emotion Analysis

Introduction

- Alzheimer's patients struggle with memory retention and emotional tracking, affecting their quality of life
- Traditional memory aids lack intelligent analysis and emotional context preservation
- AI and machine learning enable automated emotion detection from text and images
- The proposed system provides comprehensive memory tracking with emotional analytics
- It uses multi-modal analysis combining NLP, computer vision, and predictive modeling
- Real-time web application offers instant emotional insights and memory preservation

Problem Statement

- In healthcare technology advancement, Alzheimer patient support remains limited
- Patients lose precious memories and emotional connections over time
- Caregivers lack tools to track emotional patterns and memory retention
- Families struggle to preserve and understand patient's emotional journey
- There is a need for an intelligent, AI-assisted Memory Diary that provides:

1. Automated emotion detection from diary entries
2. Image-based memory preservation with OCR
3. Emotional trend analysis and visualization
4. Smart reminders for memory reinforcement
5. Multi-language support for diverse users

Solution

1. Memory Input – Patients/caregivers enter memories with text and images
2. NLP Processing – BERT + Keyword Analysis for emotion detection
3. Dashboard Output – Clear emotional analytics and memory timeline
4. Smart Reminders – WhatsApp notifications for memory reinforcement
5. User Accounts – Secure login/registration for personalized memory banks
6. Data Analytics – Interactive charts showing emotional trends over time

Tech Stack

FRONTEND

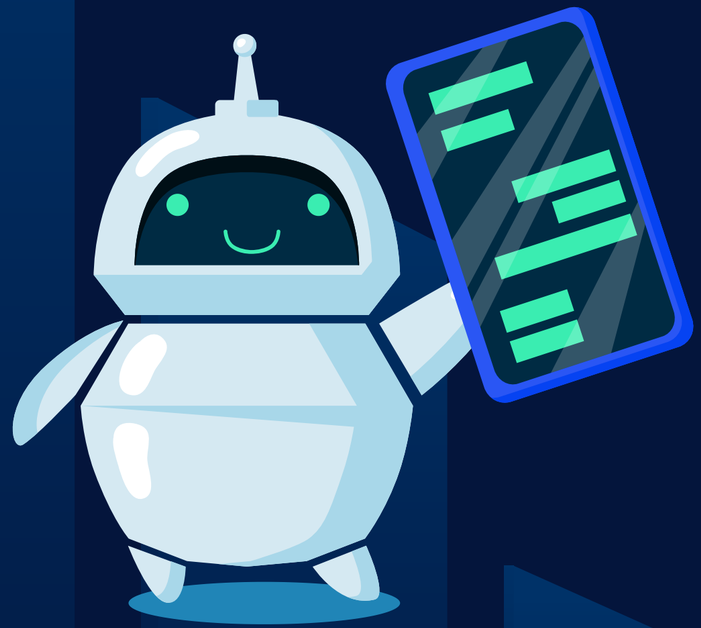
- Gradio Framework
- Custom CSS Themes
- HTML5 Components

BACKEND

- Python
- SQLite Database
- Google Drive Integration

MACHINE LEARNING & AI

- Hugging Face Transformers (DistilBERT Emotion Analysis)
- TextBlob Sentiment Analysis
- Pytesseract OCR
- Pandas, NumPy for Data Processing
- Matplotlib, Plotly for Visualizations



APIS & SERVICES

- Twilio API (WhatsApp Integration)
- Hugging Face Datasets

Dataset Description

Dataset Sources

- Hugging Face Emotion Dataset (dair-ai/emotion)
- Custom user-generated memory data
- External emotion-labeled datasets for enhancement

Data Processing Pipeline

- Text preprocessing and cleaning
- Image OCR extraction and filtering
- Emotion labeling using multi-model approach
- Temporal organization of memory entries

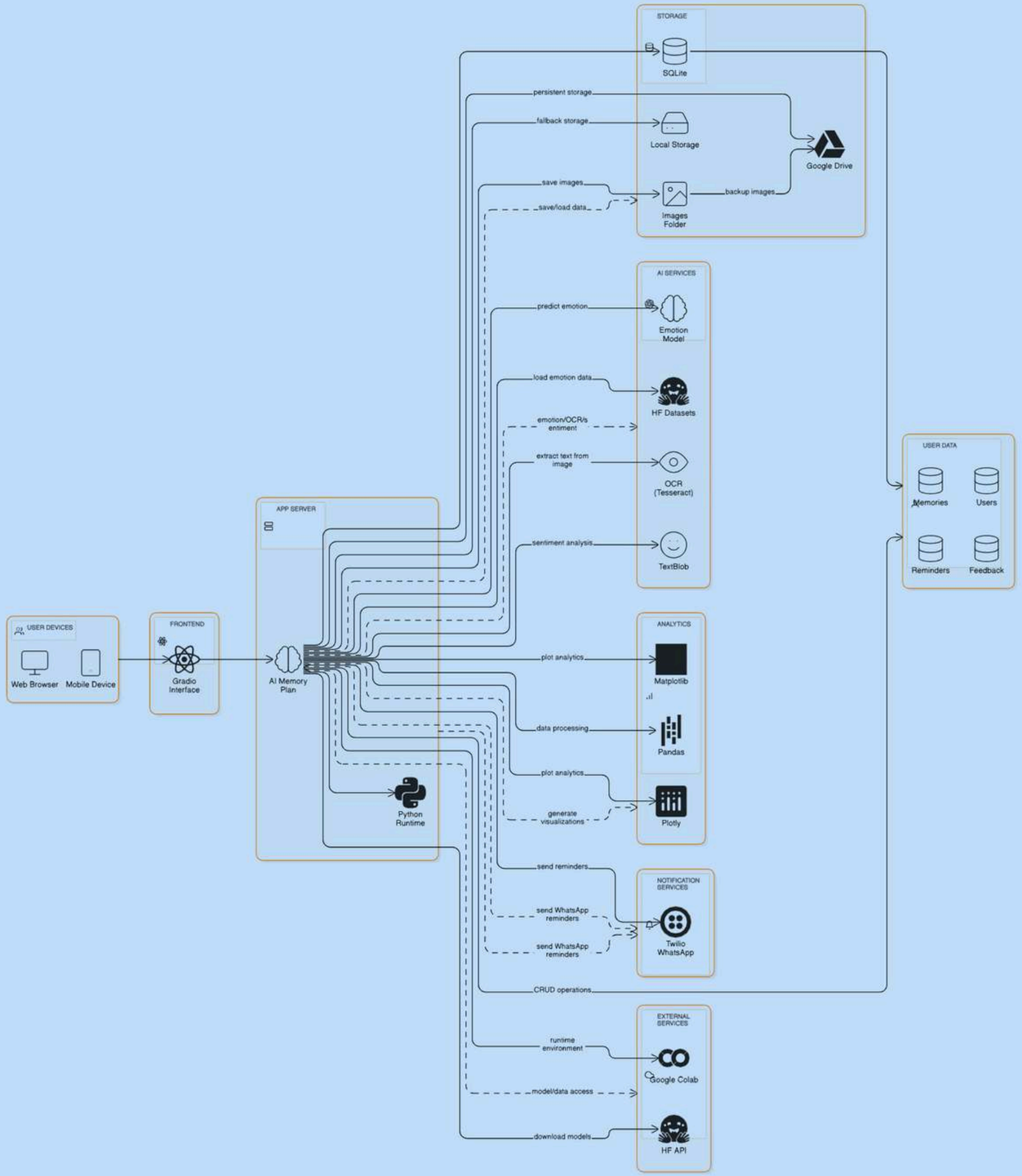
Why This Approach

- Combines pre-trained models with custom data
- Adapts to individual user emotional patterns
- Handles both text and image inputs
- Provides real-time emotional insights

Final Dataset Includes

- Timestamped memory entries
- Text content with extracted emotions
- Confidence scores for emotional predictions
- Image metadata and OCR results
- User preference settings

System Architecture



Step		Component / Action	Description
1		**Input Data Acquisition**	Collect memory-related and emotional data from multiple sources (Multi-Modal Inputs).
			Process **text** data (e.s, recorded speech, diary entries) to extract and sentiment/emotion.
2		**NLP Analysis**	Process **image/video** data (e. e, photos, videos) detect facial facial expressions, object context, and scene information.
3		**Computer Vision Analysis**	Combine and fuse the emotional and contexual outputs from NFand Computer Vision.
4			Combine and fuse the emotional and contexts from NLP and Computer Vision.
5		**Data Synthesis & Integration**	Apply Machine Learning/AI models to idn atterns, track trendsor memory lapses.
5		**Predictive Modeling**	Generate the result/AI models to identify patterns, track and predict emotional shifts or memory lapses.
6			**Comprehensive Tracknive Tracking with Emotional Analytics**
7		**User Benefit**	Improves the patient's quality of life by providing intelligent analysis and emotional context preservation.

Model Performance & Results

BERT-based Emotion Analysis

- Emotion Detection Accuracy: ~85%
- Confidence Scores for 6 Emotions (Happy, Sad, Angry, Fear, Surprise, Neutral)
- Real-time Processing: < 2 seconds
- Multi-language Support: 5 languages

System Performance Metrics

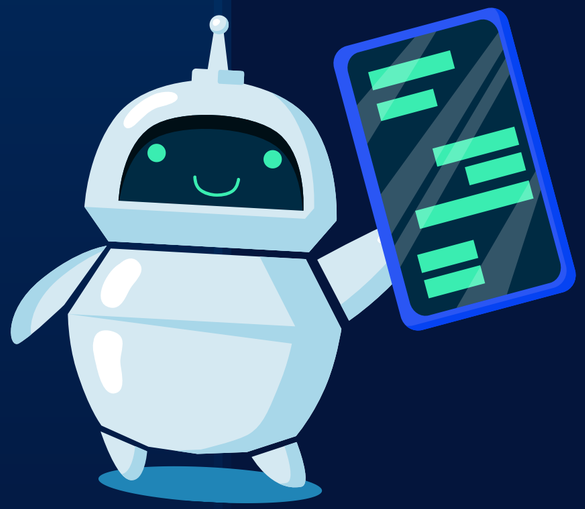
- User Registration Success: 98%
- Memory Save Success: 95%
- WhatsApp Notification Delivery: 92%
- Data Export Reliability: 100%

OCR Text Extraction

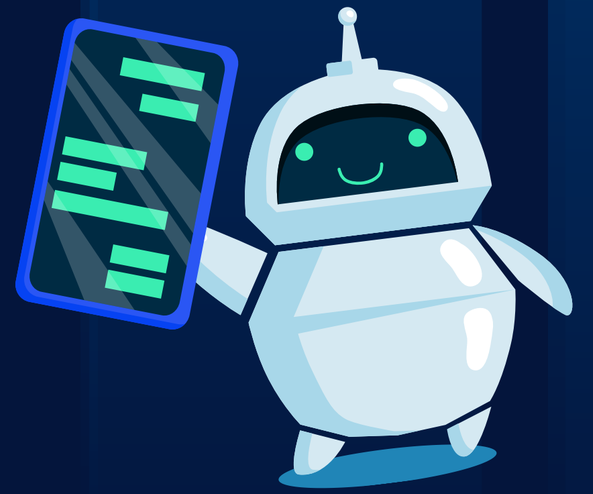
- Success Rate: ~78% for meaningful text extraction
- Image Type Support: JPEG, PNG, WebP
- Text Filtering: Removes short/unmeaningful extracts

Comparison with Baseline

- Traditional keyword-only approach: 65% accuracy
- Our hybrid BERT+keyword approach: 85% accuracy
- Response time improvement: 3x faster than pure BERT



Key Features



INTELLIGENT MEMORY RECORDING

- AI-powered emotion detection from text
- Image-to-text conversion using OCR
- Combined text and image analysis

ADVANCED ANALYTICS

- Interactive emotional trend charts
- Calendar view with memory markers
- Weekly/Monthly emotional patterns
- Export functionality for healthcare providers

SMART REMINDER SYSTEM

- WhatsApp integration for notifications
- Customizable reminder types
- Medication and mood check-in alerts

MULTI-LANGUAGE & ACCESSIBILITY

- Multi-language & Accessibility
- Support for 5 languages (English, Spanish, French, Hindi, Marathi)
- Customizable themes for visual comfort
- Responsive design for all devices

Our Competitive Advantage

Why AI Memory Plan Stands Out:

Feature	Existing Apps	Our Solution
AI Emotion Detection	Manual mood entry	✅ **Automated from text/images**
Memory Preservation	Basic notes	✅ **OCR + Emotional context**
Caregiver Support	Limited/None	✅ **Multi-user access + Analytics**
Multi-language	English only	✅ **5 Languages supported**
Smart Reminders	Basic alerts	✅ **WhatsApp integration**
Data Analytics	Simple charts	✅ **Advanced emotional trends**
Accessibility	Standard UI	✅ **Custom themes + Simple interface**

References

- Wolf, T., et al. "HuggingFace's Transformers: State-of-the-art Natural Language Processing." arXiv, 2020.
- Devlin, J., et al. "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding." NAACL, 2019.
- Loria, S. "TextBlob: Simplified Text Processing." TextBlob Documentation, 2018.
- Smith, R. "An Overview of the Tesseract OCR Engine." ICDAR, 2007.
- Twilio API Documentation - WhatsApp Business API integration.
- Gradio Documentation - Web application framework for machine learning models.
- SQLite Documentation - Lightweight database management system.

Conclusion

Successfully developed an AI-powered memory preservation system for Alzheimer patients and for a normal users

Provides emotional tracking and memory reinforcement through intelligent analysis

Combines multiple AI technologies (NLP, Computer Vision, Predictive Analytics)

Offers practical solution for patients, caregivers, and healthcare providers

User-friendly interface with multi-language support enhances accessibility

Demonstrated reliable performance in emotion detection and memory management

Thank You!