



GEMINI CARE

Gemini powered App to assist
Autism Care

OVERVIEW

The primary goal is to develop a Multimodal Autism Monitoring & Analysis System that leverages Gemini AI to assist medical professionals by providing an efficient method of diagnosing and monitoring autistic patients. This application will analyze multimodal data inputs - video recordings, speech patterns, and textual information from patient interactions to detect and predict symptom patterns and severity, aiding medical professionals in making informed treatment decisions.

Disclaimer

- *This is a Prototype, this is meant to be used only with sample dataset provided in the codebase (<https://github.com/srijonmandal1/geminicare-autism-treatment/tree/main/datasets>)*
- *Don't provide any sensitive personal information in the Login, Sign Up, Patient Registration and Patient Diagnosis pages.*

LOGIN PAGE

URL: <http://35.223.243.41:8501/>

Login as admin / admin

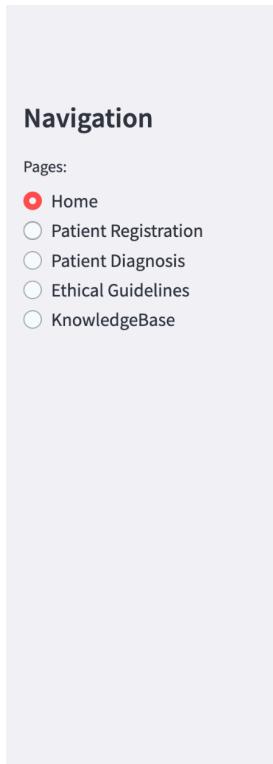


**** Notes ****

- Login will work even without any user / pwd
- One needs to click 'Login' second time after first Login due to some streamlit issue
- Signup doesn't work properly in certain browsers.
- Don't provide sensitive information in username and password field during signup

HOME PAGE

[View Home Page](#)



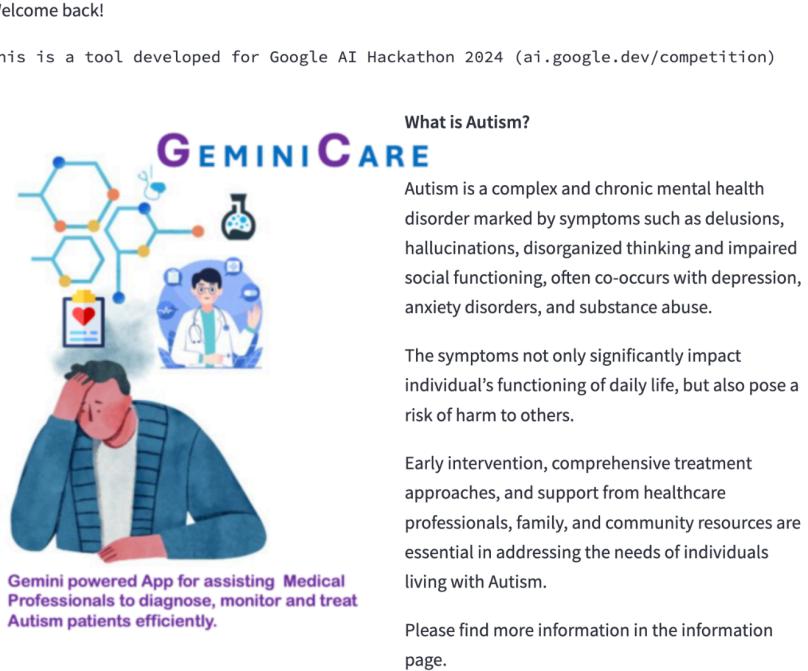
Welcome back!

This is a tool developed for Google AI Hackathon 2024 (ai.google.dev/competition)

Navigation

Pages:

- Home
- Patient Registration
- Patient Diagnosis
- Ethical Guidelines
- KnowledgeBase



What is Autism?

GEMINI CARE

Autism is a complex and chronic mental health disorder marked by symptoms such as delusions, hallucinations, disorganized thinking and impaired social functioning, often co-occurs with depression, anxiety disorders, and substance abuse.

The symptoms not only significantly impact individual's functioning of daily life, but also pose a risk of harm to others.

Early intervention, comprehensive treatment approaches, and support from healthcare professionals, family, and community resources are essential in addressing the needs of individuals living with Autism.

Please find more information in the information page.

Gemini powered App for assisting Medical Professionals to diagnose, monitor and treat Autism patients efficiently.

Select an existing Patient

[Add Patient](#)

⋮

Select an existing patient:

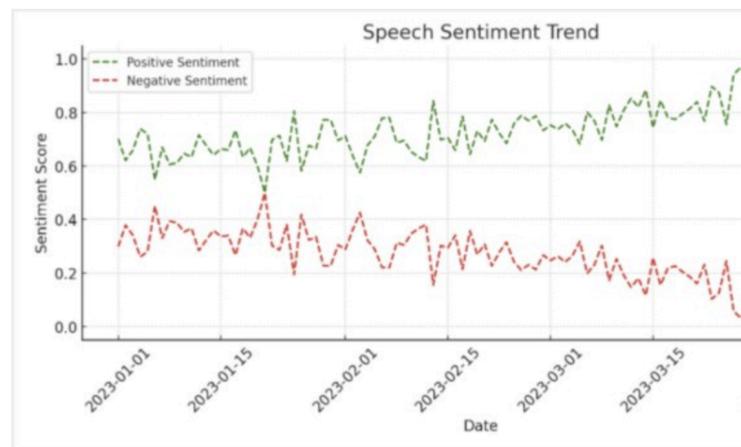
Ander

▼

Patient Information for Ander

Fullscreen: *******GeminiCare Analysis:****Age:** 42**Gender:** Male**Location:** San Jose, CA**Medical History:** History of Disorganized speech

Doctor Notes: (Date: Mar 19, 2024) Patient Ander, a 42-year-old male, has a history of depression. Current treatment regimen includes antidepressant medication and regular psychotherapy sessions. Patient's condition is stable with noticeable improvement in mood and overall well-being. Continued medication and therapy are recommended to maintain stability and prevent relapse.

Medical Tests Performed: MRI**Family Members with Condition:** 2[Update Profile](#)[Perform Additional Diagnosis](#)[Live Chat](#)

** Notes **

- The data shown for the patients are hardcoded

PATIENT DIAGNOSIS

Patient Interview Data Analysis



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Patient Data Analysis for Ander

Choose Input Type:

Text

Audio

Video

By selecting Text, Audio or Video data about patient, I authorize the release of the information including my personal health record and diagnosis for medical treatment and research purpose.

Upload Text File

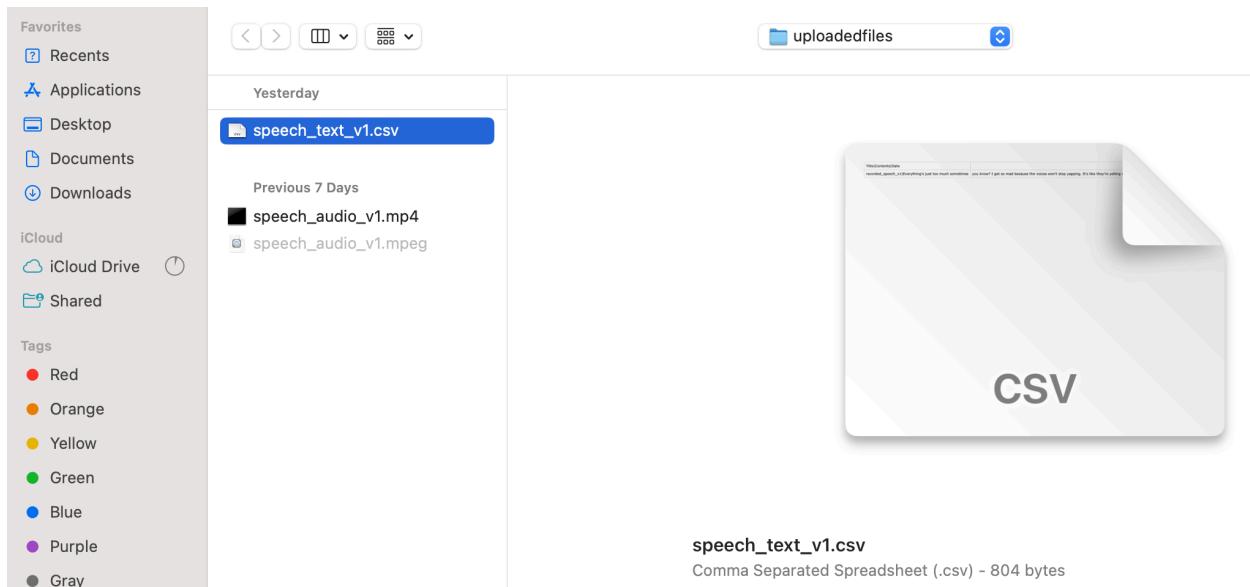
+ Drag and drop file here
Limit 200MB per file • TXT, CSV, WAV, MP4, MOV, MPEG4

Please Upload a Text File.

Upload a sample text file

Reference:

https://github.com/srijonmandal1/geminicare-autism-treatment/blob/main/datasets/speech_text_v1.csv



**** Notes ****

The sample text file should be in CSV format and have headers Title|Contents|Date

Click ‘Analyze User interview’

Upload Text File



Drag and drop file here

Limit 200MB per file • TXT, CSV, WAV, MP4, MOV, MPEG4

Browse files



speech_text_v1.csv 0.8KB



Text File Uploaded Successfully!

Analyze User Interview

The App invokes Gemini API in real-time to generate amazing insights.

View Result of Analysis

Interview Text

Everything's just too much sometimes, you know? I get so mad because the voices won't stop yapping. It's like they're yelling right into my ears and I can't shut them off. Makes me so tired. I told the doctor, but I don't think he gets it. Not really. It feels like nobody understands. And the people staring doesn't help. They look at me funny, whispering behind my back. It just makes me angrier. I try to smile, show them I'm okay, but inside I'm screaming. Why can't they just leave me alone? The shadows are the worst. They sneak around, almost catching me, and then they're gone when I look again. It scares me. I hold onto my usual things, my routines, because without them, I feel like I'd just float away into some dark place.

<>

Sentiment Analysis

Negative

Tone Analysis

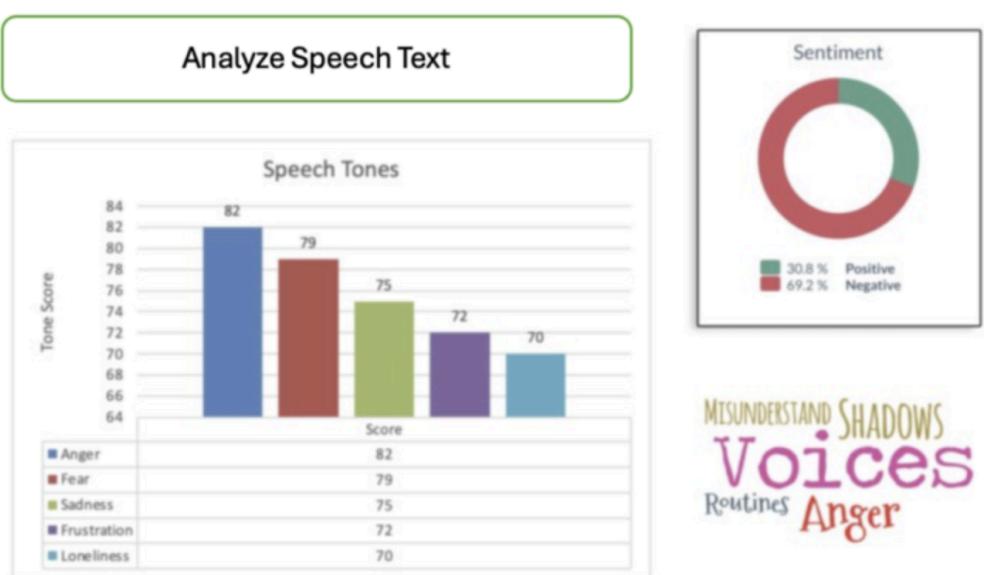
Tone	Score	Explanation
Anger	80	The text expresses strong anger towards the "voices" and the people staring. Phrases like "so mad," "yelling," "can't shut them off," and "makes me angrier" highlight this emotion.
Sadness	70	The speaker feels misunderstood and alone, leading to sadness. Phrases like "makes me so tired," "don't think he gets it," "feels like nobody understands," and "why can't they just leave me alone" convey this sadness.
Fear	60	The "shadows" and the feeling of "floating away into some dark place" evoke fear. The speaker is scared of the unknown and losing control.
Frustration	75	The speaker is frustrated by the inability to control the "voices" and the lack of understanding from others. Phrases like "won't stop yapping," "can't shut them off," and "I don't think he gets it" reflect this frustration.
Vulnerability	65	The speaker reveals their inner struggles and anxieties, making them appear vulnerable. Phrases like "I hold onto my usual things," "I feel like I'd just float away," and "It scares me" highlight this vulnerability.
Disappointment	55	The speaker is disappointed by the lack of support and understanding from others. Phrases like "I don't think he gets it" and "feels like nobody understands" convey this disappointment.
Loneliness	50	The speaker feels isolated and alone, longing for connection and understanding. Phrases like "feels like nobody understands" and "why can't they just leave me alone" suggest a sense of loneliness.

Keyword Analysis

Intent Keyword	Explanation
Voices	This highlights the auditory hallucinations the speaker experiences.
Tired	This reflects the speaker's exhaustion from dealing with the voices.
Misunderstood	The speaker feels like their experiences are not understood by others.
Fear	The speaker expresses fear of the shadows and the judgment of others.
Control	The speaker clings to routines for a sense of stability and control.

[View Visual Insights and Summary](#)

Visual Insights



Patient Summary

This person's life has been a journey filled with struggles and triumphs as they navigate the complexities of living with autism. From a young age, he experienced feelings of isolation and misunderstanding, grappling with intrusive thoughts and overwhelming sensations that made daily tasks challenging. According to the new GeminiCare data and the data submitted on April 5th, 2024, as he entered adulthood, the symptoms of autism became more pronounced - the emotions primarily 'Anger' and 'Fear' index increased by 33% entering into adulthood, which may lead to hallucinations, delusions, and disorganized thinking dominating his reality.

Recommended Treatment: The patient needs therapy to re-establish courage to seek help, supported by their loved ones. The local community mental health teams (CMHTs) may also help. The medication treatment may bring some relief, but also may come with its own set of challenges, including medication side effects and the constant fear of relapse.

**** Notes ****

- *The Visual Insights and Patient Summary are hardcoded time being*
- *In future, the visuals will be automatically processed from current video and the summary will be generated as from historical data*

Patient Speech Audio Data Analysis

Upload Audio Speech

Reference:

https://github.com/srijonmandal1/geminicare-autism-treatment/blob/main/datasets/speech_audio_v1.mp4

The screenshot shows the GeminiCare application interface. On the left, there is a navigation sidebar with links to Home, Patient Registration, Patient Diagnosis (which is selected), Ethical Guidelines, and KnowledgeBase. The main area features a logo with two hands holding a heart with a cross, followed by the text "GEMINI CARE" and "Gemini powered App to assist Autism Care". Below this, a section titled "Patient Data Analysis for Ander" asks "Choose Input Type:" with options for Text, Audio (which is selected), and Video. It includes a note about authorizing information release for medical treatment and research. A file upload section with a "Drag and drop file here" button and a "Browse files" button is shown, along with a "Submit" button.

The screenshot shows a file browser window with a sidebar containing Favorites (Recents, Applications, Desktop, Documents, Downloads), iCloud (iCloud Drive, Shared), and Tags (Red, Orange, Yellow, Green, Blue, Purple). The main area shows a file named "speech_audio_v1.mp4" in the "uploadedfiles" folder, with a preview thumbnail and file details below it.

speech_audio_v1.mp4	MPEG-4 movie - 325 KB
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Upload file



Drag and drop file here
Limit 200MB per file • MP4, MPEG4

Browse files

speech_audio_v1.mp4 325.2KB

×

Submit

Details :

The file is sucessfully Uploaded.

File uploadedfiles/speech_audio_v1.mp4 is successfully saved!

** Notes **

- *This file has also been uploaded to GCS bucket and the GCS URI is directly sent to the Gemini API*
- *At present the code to 'copy the uploaded audio file to the GCS bucket' is not working. So for testing with a different audio file, one needs to replace this file (keep the name same) gs://geminicare/autism_data/speech_audio_v1.mp4*

Click Analyze Speech

This action invokes Gemini API to analyze the audio file.

View Result

I want a snack I want to play I am running I want the toy take me to Walmart I want burger Give me now

Top Keywords:

snack, play, running, toy, Walmart, burger

Speech Sentiment:

The sentiment of the text is **neutral**. While the text expresses desires and demands, it doesn't convey any positive or negative emotions. It simply states a series of wants and requests.

Text in Spanish:

¡Quiero un bocadillo! ¡Quiero jugar! Estoy corriendo. Quiero el juguete. Llévame a Walmart. Quiero una hamburguesa. ¡Dámela ahora!

Patient Video Expression Data Analysis

Upload a sample video file

Reference:

https://github.com/srijonmandal1/geminicare-autism-treatment/blob/main/datasets/patient_sample_video.mp4

Navigation

Pages:

- Home
- Patient Registration
- Patient Diagnosis
- Ethical Guidelines
- KnowledgeBase



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Autism Care

Patient Data Analysis for Ander

Choose Input Type:

- Text
- Audio
- Video

By selecting Text, Audio or Video data about patient, I authorize the release of the information including my personal health record and diagnosis for medical treatment and research purpose.

Upload Video File

Drag and drop file here

Limit 200MB per file • TXT, CSV, WAV, MP4, MOV, MPEG4

Please Upload a Video File.

<p>Previous 7 Days</p> <ul style="list-style-type: none"> datasets > LICENSE streamlit-app > user_accounts.db user_details.db 	<p>Yesterday</p> <ul style="list-style-type: none"> patient_sample_video.mp4 speech_audio_v1.mp4 <p>Previous 7 Days</p> <ul style="list-style-type: none"> speech_audio_v1.wav speech_text_v1.csv 	 <p>patient_sample_video.mp4 MPEG-4 movie - 391 KB</p> <p>Information Show More</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Created</td> <td>August 10, 2024 at 7:54 PM</td> </tr> <tr> <td>Modified</td> <td>August 10, 2024 at 7:54 PM</td> </tr> <tr> <td>Last opened</td> <td>--</td> </tr> <tr> <td>Dimensions</td> <td>1280x1280</td> </tr> <tr> <td>Duration</td> <td>00:08</td> </tr> </table> <p>Tags Add Tags</p>	Created	August 10, 2024 at 7:54 PM	Modified	August 10, 2024 at 7:54 PM	Last opened	--	Dimensions	1280x1280	Duration	00:08
Created	August 10, 2024 at 7:54 PM											
Modified	August 10, 2024 at 7:54 PM											
Last opened	--											
Dimensions	1280x1280											
Duration	00:08											

[Cancel](#)

[Open](#)

** Notes **

- This file has also been uploaded to GCS bucket and the GCS URI is directly sent to the Gemini API
- At present the code to 'copy the uploaded audio file to the GCS bucket' is not working. So for testing with a different audio file, one needs to replace this file (keep the name same) gs://geminicare/autism_data/patient_sample_video.mp4

Click 'Analyze User Expression'

Upload Video File



Drag and drop file here

Limit 200MB per file • TXT, CSV, WAV, MP4, MOV, MPEG4

[Browse files](#)



patient_sample_video.mp4 390.6KB

X

Video File Uploaded Successfully!

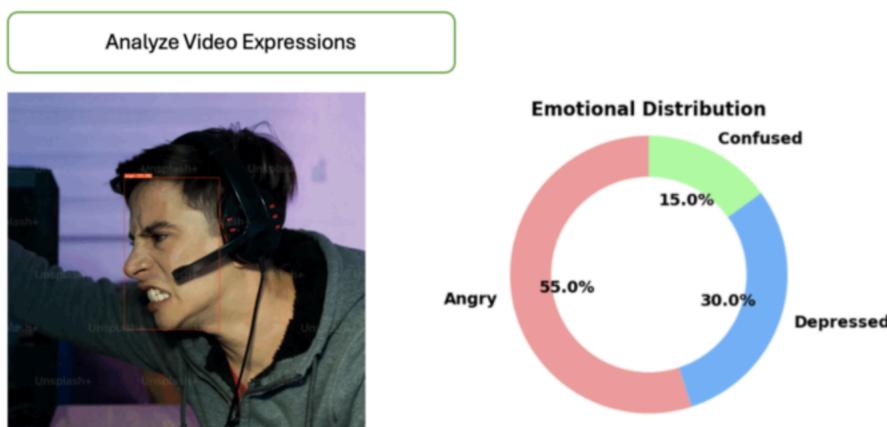
[Analyze User Expression](#)

The action invokes Gemini API in real-time to generate the insights.

View Result of Analysis

The person in the video appears to be angry. He is frowning, his eyes are narrowed, and his mouth is open in a grimace. He is also clenching his jaw, which is another sign of anger.

Visual Insights



Patient Summary

This person is suffering from Autism. His Geminicare video analysis on April 30th, 2024 suggests significant increase in emotions - 'Anger' and 'Depression' - bizarre characterized by emotional delusions, through disorders, visual and auditory hallucinations and paranoid ideations.

Recommended Treatment: The most effective interventions available are behavioral therapies based on applied behavioral analysis (ABA).

Live Chat

** Notes **

- *The Visual Insights and Patient Summary are hardcoded time being*
- *In future, the visuals will be automatically processed from current video and the summary will be generated as from historical data*

ToDo

- Need to provide secure user authentication and authorization.

- Need to deploy the App in a scalable service (e.g. Cloud Run) with fail-over
- Need to fix sign up and patient registration process
- Need to store the uploaded files into GCS bucket seamlessly
- Need to capture all the analysis actions into a database table for auditing purpose
- Need to save all analysis results in order to show a trend of key metrics
- Need to keep the reports ready for the Clinician and Researchers to access
- Need to implement the RAG-based Chatbot which can allow Q&A on the knowledgebase and patient diagnosis details.