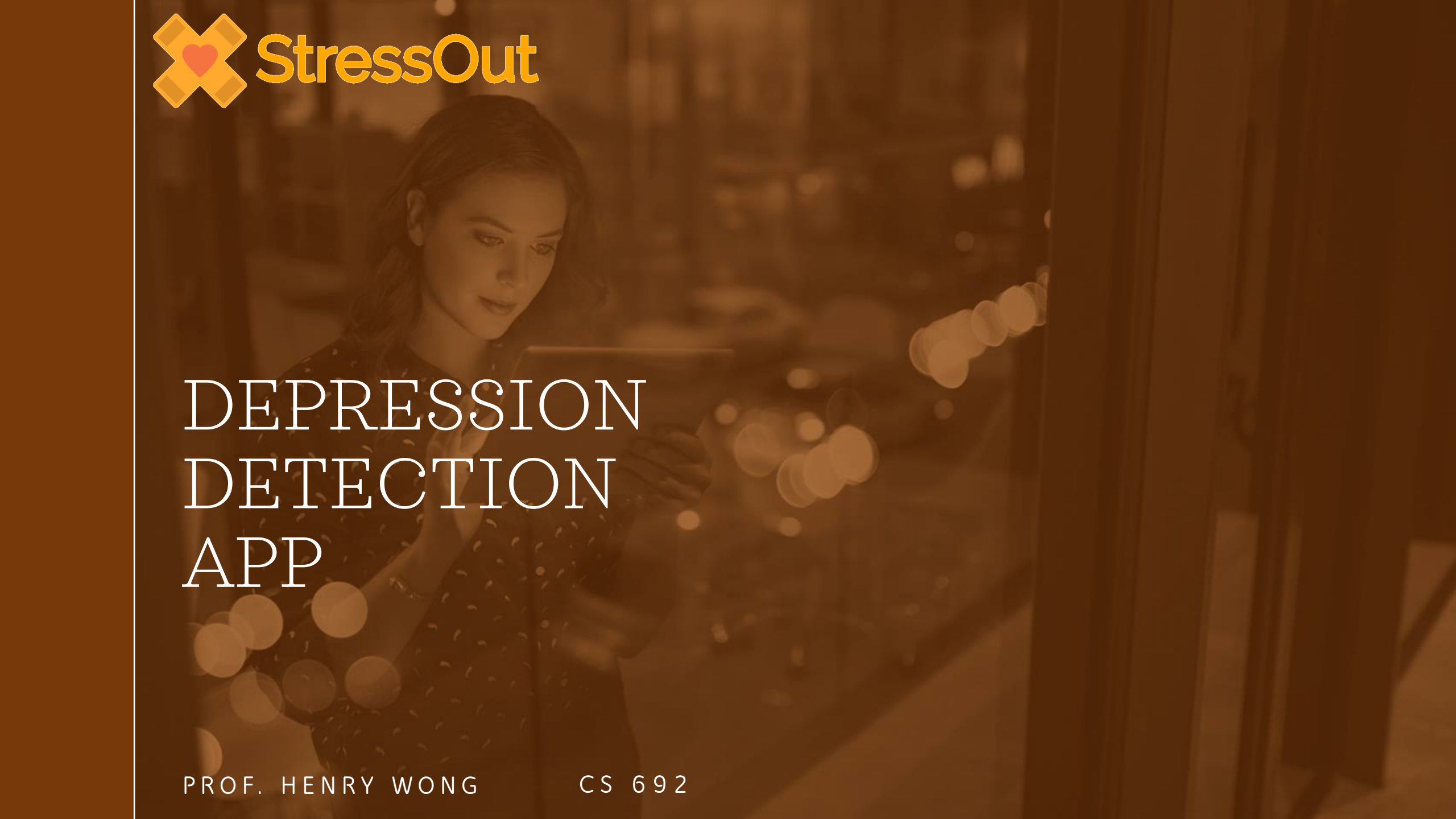


DEPRESSION DETECTION APP

PROF. HENRY WONG CS 692

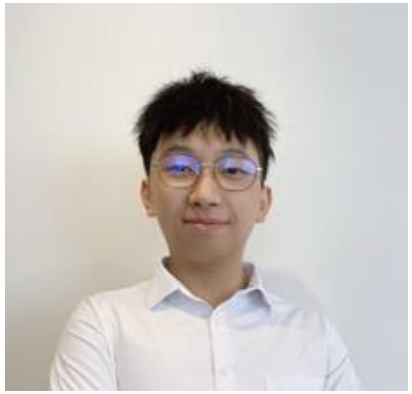
StressOut

AGENDA

1	Project Description and problem statement
2	Description of minimal viable product and all attributes, including product backlog
3	Acceptance Criteria & user stories
4	Sprint 6 backlog and test cases
5	Team metrics for every sprint
6	Application screenshot & ML model description
7	API and Retrospective & plans for sprint 7

OUR TEAM

Omkar Shitole
Developer & DBA



Yuxiang Liu
Lead Software Engineer

Shivani Chavan
Developer

Wangbo Gu
Developer

Artem Kolmogorov
Developer & Project Manager

Siddarth Ravirala
Developer

StressOut

IMPROVEMENTS MADE FROM PROFESSOR'S FEEDBACK

IMPROVEMENTS RELATED TO SPRINT RECAP

We have implemented improvement suggested by Professor Wong with sprint recap. Now it is clear and easy to understand.

IMPROVEMENTS OF ACCEPTANCE CRITERIA

We have rewritten scenarios of acceptance criteria as well as added id to test cases. This has improved clarity on what user stories were completed and tested.

IMPROVEMENT OF TEAM VELOCITY AND SPRINT BURNDOWN CHARTS

We have clearly marked all charts and histograms depicted in our team velocity and burndown charts.

ADDED DETAILS FOR PLANS ON FUTURE SPRINTS

We have added more detailed description of plans for future sprints.

StressOut

PROJECT DESCRIPTION

Project Name	StressOut
Team	Bug Terminator
Project Description	Detecting early signs of depression based on users' pictures and quizzes **For** customers **Who** want to manage their mental health **The** StressOut app **Is a** mobile app **That** analyzes user's images and quiz results and provides accurate assessment **Unlike** traditional way of visiting specialists. **Our application** provides accessible, accurate and daily measurement of person's mental state
Benefit Outcomes	Users can check their mental state anywhere and anytime Users can track their mental state over long period of time Users can receive useful tips for managing depression
Github Link	https://github.com/htmw/2023S-Team2

PROJECT DESCRIPTION

We are developing depression detection system that uses artificial intelligence model to analyze person's face with images or current mood with text, to help find depression sings. Our detection system is trained with a unique dataset depression faces from messages and images. We believe that certain linguistic traits can be examined and linked to possible depressive symptoms as well as used to forecast self-destructive behavior. The training result we want to achieve is the system capable of analyzing the input (messages and images) from users, and detect the type of depression such as anxiety, bipolar or paranoia.

StressOut

PROBLEM STATEMENT

Depression is a prevalent mental health disorder that affects millions of people worldwide. The condition is characterized by a persistent feeling of sadness, hopelessness, and loss of interest in daily activities. It significantly impairs a person's ability to function and can lead to a range of physical and emotional problems. Early detection of depression is crucial for effective treatment, as it can reduce the severity and duration of symptoms and improve a person's quality of life.

However, traditional methods of detecting depression, such as self-report questionnaires or clinical interviews, have several limitations. Self-report questionnaires rely on a person's ability to accurately report their symptoms, which can be influenced by various factors, such as social desirability bias, memory recall bias, and language barriers. Clinical interviews can also be subjective and may vary depending on the clinician's experience and training.

As a result, there is a need for an objective and reliable method of detecting depression. One potential solution is the use of machine learning algorithms to analyze various data sources, such as speech patterns, facial expressions, and physiological signals, to identify indicators of depression. These systems have shown promising results in early studies and have the potential to revolutionize the field of mental health.

Detecting depression early is essential, as the condition can lead to a range of negative outcomes, including increased risk of premature death, suicidal thoughts, and impaired daily functioning. By developing accurate and reliable detection systems, we can improve the lives of millions of people who suffer from depression worldwide.

TEAMWORK AGREEMENT

StressOut

Team Agreement

Communication

- The team will communicate with each other through a variety of channels. For weekly meetings for meaningful team discussions, zoom meetings will be used. All the team members are highly encouraged to keep their cameras on, which will be able to build trust between the team members and reflect transparency.
- To discussion regarding minute details and doubts or anything urgent, a Whatsapp messenger group will be used.
- To share the final deliverables, Google docs will be used where all the team members can edit the document.
- A common platform called Trello has been set up for all team members, where designated groups have been created, such as Developers, Business Analyst, Product Owner.
- Database management, bugs, attendance, weekly -plan, and meeting minutes. This manages all the bits and pieces of the project and makes the project management efficient.

Work division and Participation

- The entire project work should be divided into equal parts, and equal responsibilities should be given to all the team members.
- Each team member should complete their division of work before the deadline. If they are unable to complete the work on time, that hinders the performance of the entire team. If in case a team member is facing trouble and issues at some point, they can share it with others so that they can help each other and complete the work before the deadline.
- All the team members are expected to attend the meetings promptly.
- Absence during multiple meetings will affect the team's performance and efficiency. The team member can discuss beforehand with the team leader if he/she is going to miss the meeting or make it up for it before the next meeting is scheduled.
- Work is separated between members of the group separated voluntary, however if members lacks participation product owner is entitled to assign necessary tasks to absentee members.
- In case member is absent during meetings, member pledges to support whichever decision is approved during that meeting.

Meetings

- All the team members will meet on zoom virtually every Tuesday and Friday. All the team members have to be present, as attendance is mandatory unless there is an exceptional case.
- The team leader would be responsible for sending meeting details and conducting the meeting.
- A meeting track or meeting minutes report would be listed after every meeting to keep track of the project and its progress.
- Every team member is expected to come u with ideas, participate in the discussion, and give an update on their progress for their part of the work.

Respect

• Making sure all team members always have chance to share their opinion

• All members agree to respect each others personal time and try not bother members during night time unless it is urgently required by the project.

Team Member	Email
Shivani Chavan	shivani.chavan@pace.edu
Yuxiang Lei	yl26417p@pace.edu
Omkar Shinde	os33654n@pace.edu
Wanghe Gu	wg10154n@pace.edu
Siddharth Ravirala	sr64139n@pace.edu
Artem Kolmogorov	ak71778n@pace.edu

PERSONAS

JACK

Profile

Jack, a 35-year-old software engineer who has a history of depression and anxiety. He often finds himself feeling overwhelmed at work and is struggling to balance his job and personal life. He wants to find a way to manage his symptoms so that he can be more productive and happier.

Name: Jack
Age: 35
Location: Chicago, MI
Job: Software Engineer
Salary: 92 000 – 110 000$/annually
Family: Single

Interests

- Riding Bike
- Goes Kayaking
- Attending live concerts

Frustration

- Managing depression
- Wants to change job, but unable

Goals

- Moving to south
- Finding friends
- Buying a bigger house

StressOut

PERSONAS

SARAH

Profile

Sarah, a 25-year-old graphic designer who has been feeling down for the past few months. Despite her successful career and supportive friends and family, she feels unfulfilled and struggles to find joy in her everyday life. She wants to find a way to manage her depression and is open to using technology to help her do so.

Name: Sarah
Age: 25
Location: Los Angeles, CA
Job: Graphic Designer
Salary: 66 000 – 70 000$/annually
Family: Single

Interests

- Writing own comic books
- Everyday swimmer
- Loves animals
- Watching series

Frustration

- Traffic in Los Angeles area
- Living alone for a long time

Goals

- Buying her own house
- Building lifelong relationships
- Finding friends

StressOut

PERSONAS

LISA

Profile

Lisa, a 40-year-old stay-at-home mom who is feeling overwhelmed and exhausted. She is struggling to keep up with the demands of taking care of her children and household, and she often feels like she is failing as a mother. She wants to find a way to manage her stress and feelings of inadequacy.

Name: Lisa
Age: 40
Location New-York, NY
Job: Unemployed
Salary: N/A
Family: Married, two kids

Interests

- Reading romantic novels
- Going for beach holidays
- Loves animals
- Watching series

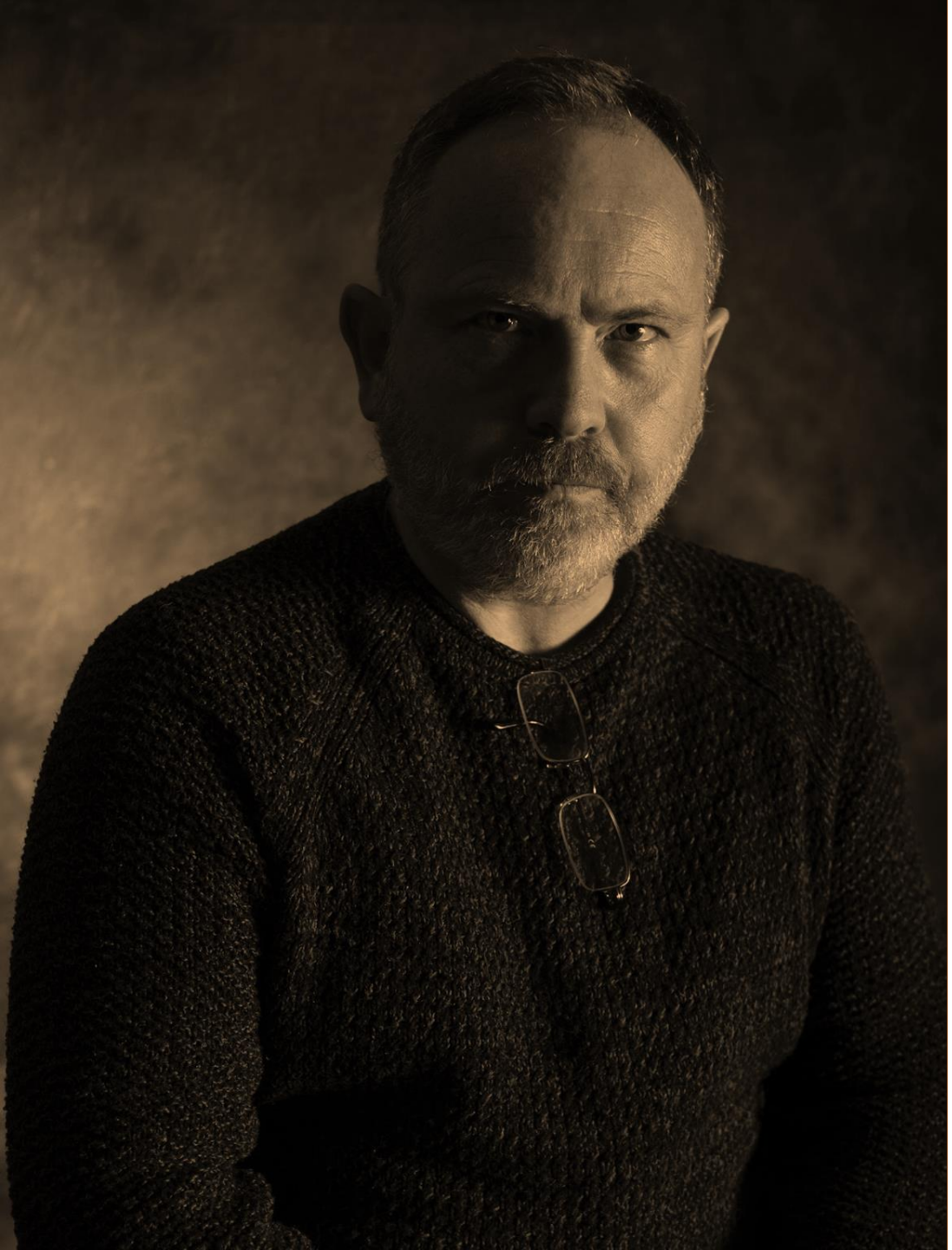
Frustration

- Her husband going for a long business trip
- Having troubles with her kids

Goals

- Taking dog from shelter
- Helping kids with college

StressOut



PERSONAS

TOM

Profile

Tom, a 50-year-old small business owner who is feeling stressed and burnt out. Despite the success of his business, he is feeling overwhelmed by the responsibilities and pressure of running it. He wants to find a way to manage his stress and anxiety so that he can enjoy his success and have a better work-life balance.

Name: Tom
Age: 50
Location: Austin, TA
Job: Self-Employed
Salary: 150 000 $/annually
Family: Divorced

Interests

- Going hunting & fishing
- Taking rides in his chopper

Frustration

- Declining business profits
- Having health problems

Goals

- Building strong portfolio for his 401-k
- Finding new friends

StressOut

StressOut

MVP, TECHNOLOGIES & ALGORITHMS

MINIMAL VIABLE PRODUCT

Home Page

- A welcome message that briefly introduces the app and its purpose
- A button or link to create an account or log in if you already have one
- A list of features and resources available within the app, such as self-assessment questionnaires, mood trackers, and mental health resources
- A prominent call-to-action encouraging users to take a self-assessment or start tracking their mood

Profile/History of Consultation

- A section where you can edit your personal information, such as your name, email address, and password

StressOut

MINIMAL VIABLE PRODUCT

Image upload/Take Picture

- A camera button that allows you to take a picture directly within the app
- A gallery button that allows you to upload pictures from your camera roll
- An option to add captions or notes to each image, to help you remember important details or context

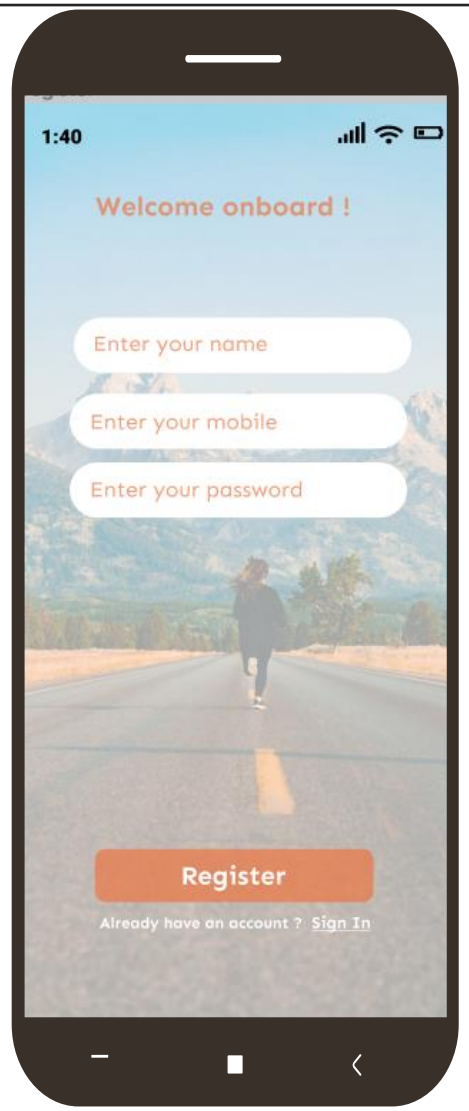
Recommendation

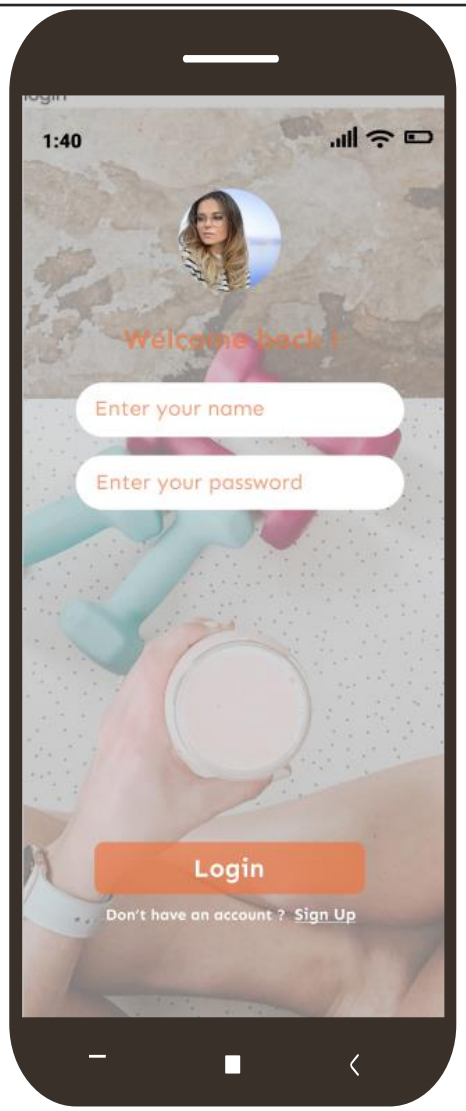
- A dashboard that displays any recommendations or next steps based on your self-assessment results, including suggestions for lifestyle changes, self-care practices, or professional treatment options

StressOut

StressOut

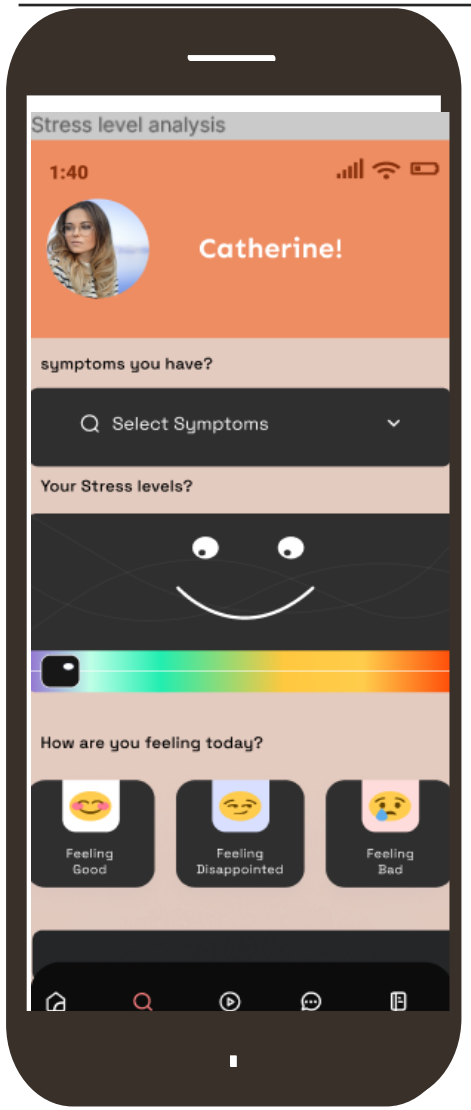
PROTOTYPE

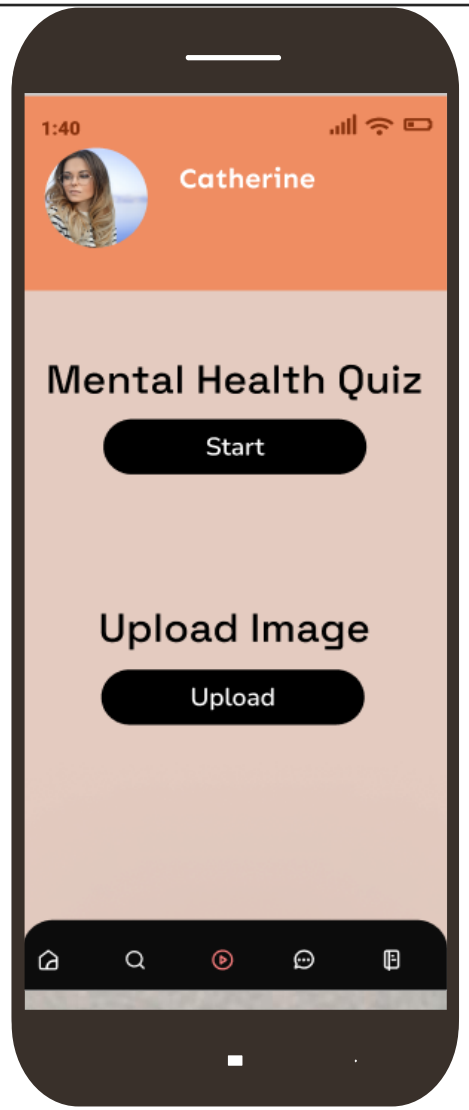


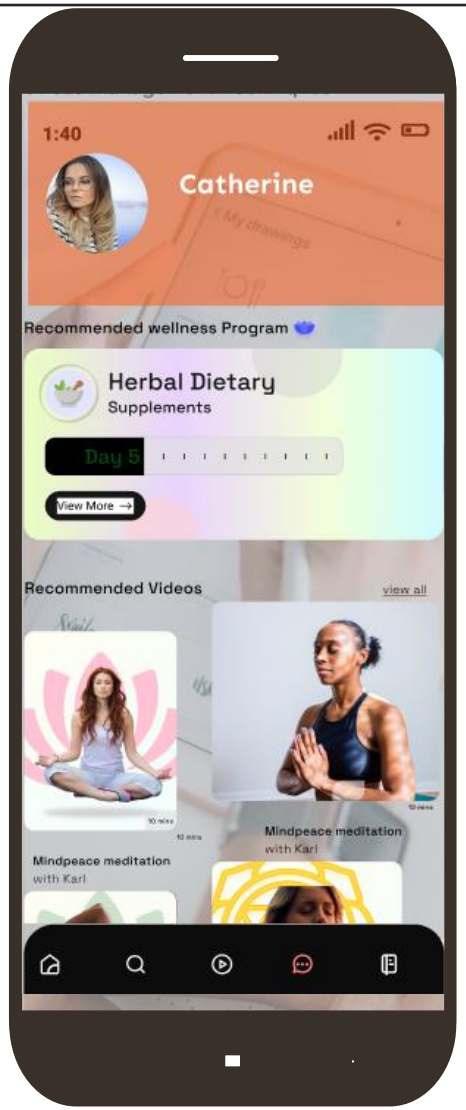


StressOut

PROTOTYPE







ALGORITHMS & TECHNOLOGIES

TensorFlow

Keras

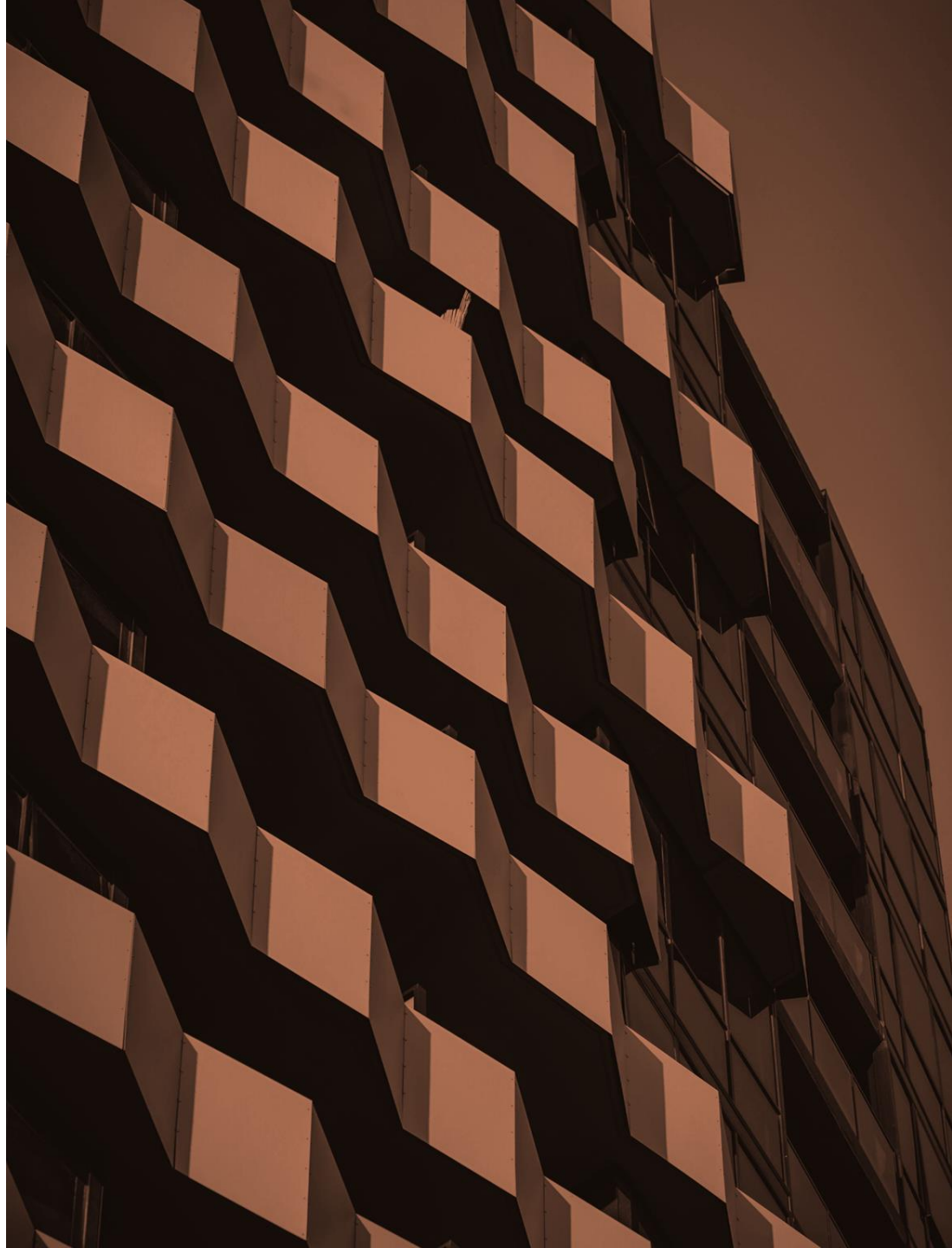
render

FastAPI

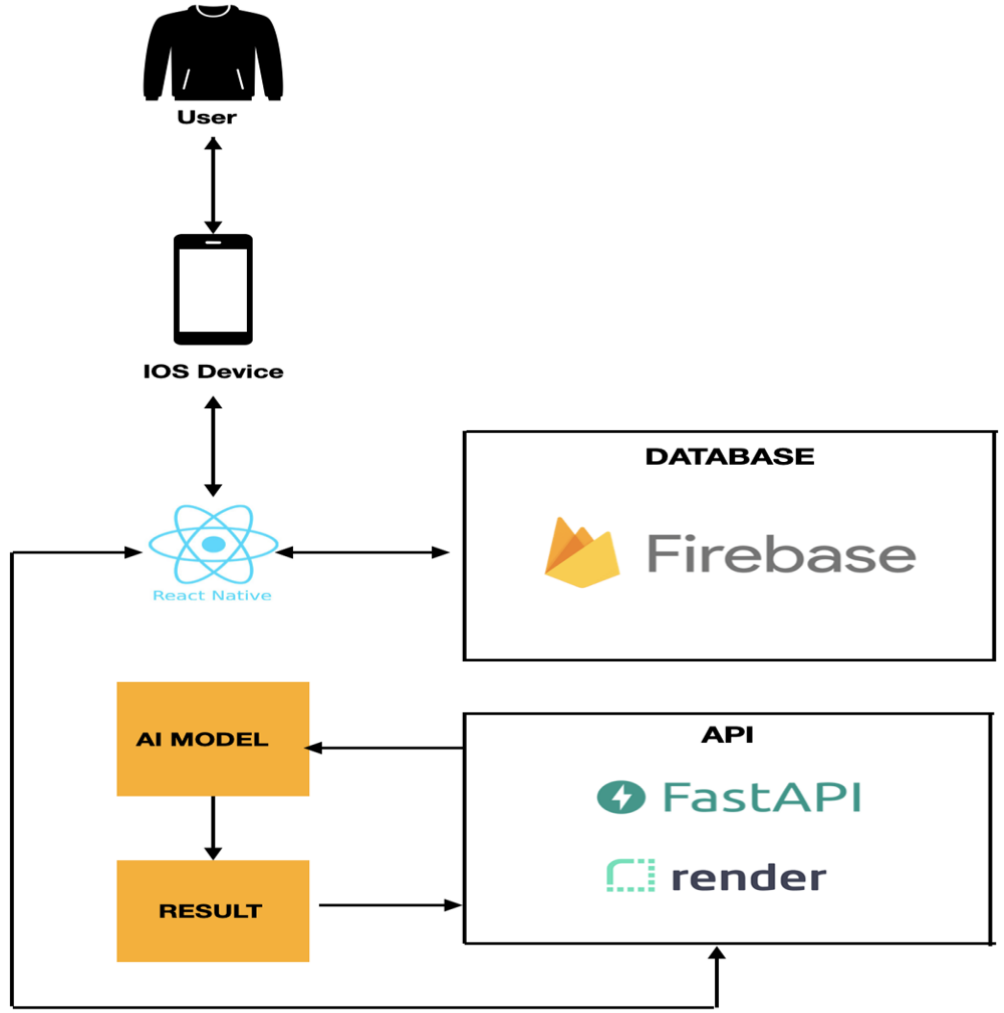
React Native

Firebase

StressOut



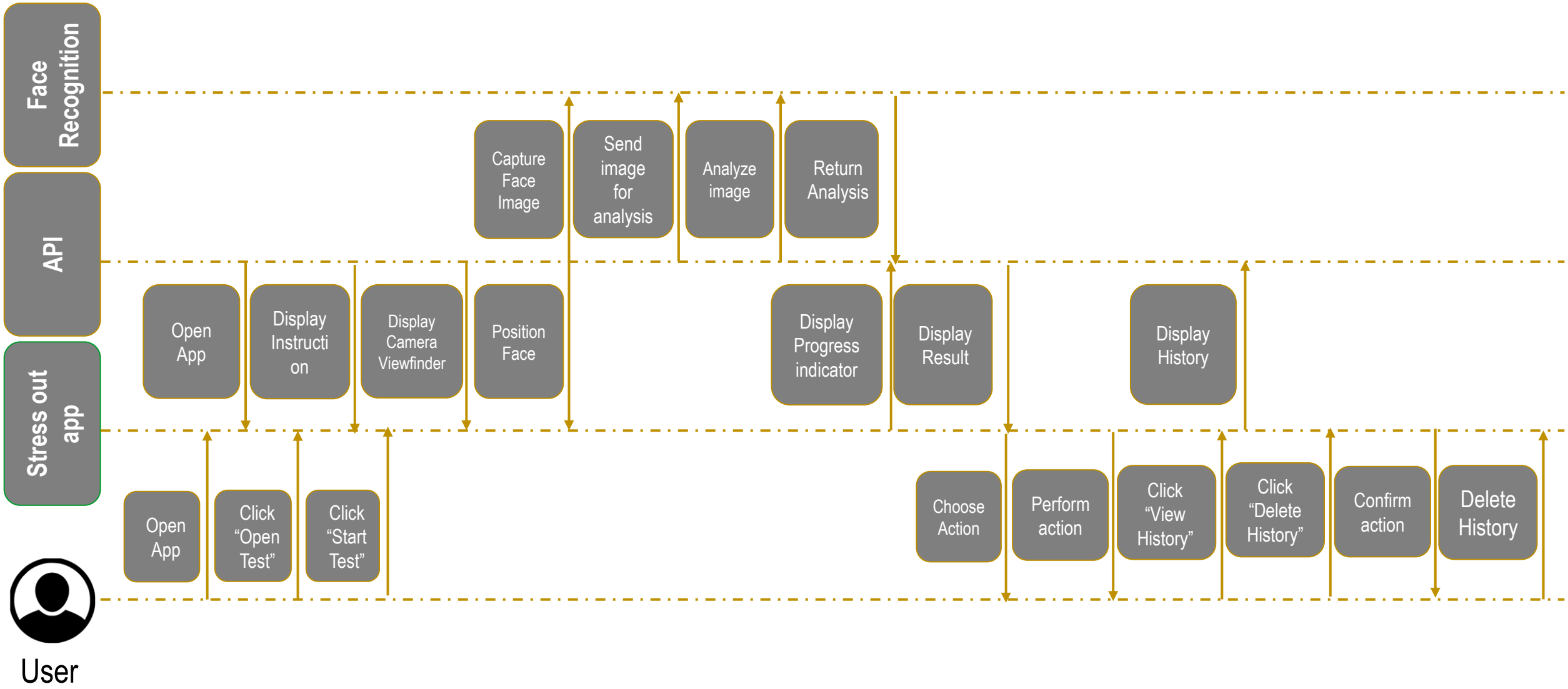
CONCEPTUAL ARCHITECTURE DIAGRAM



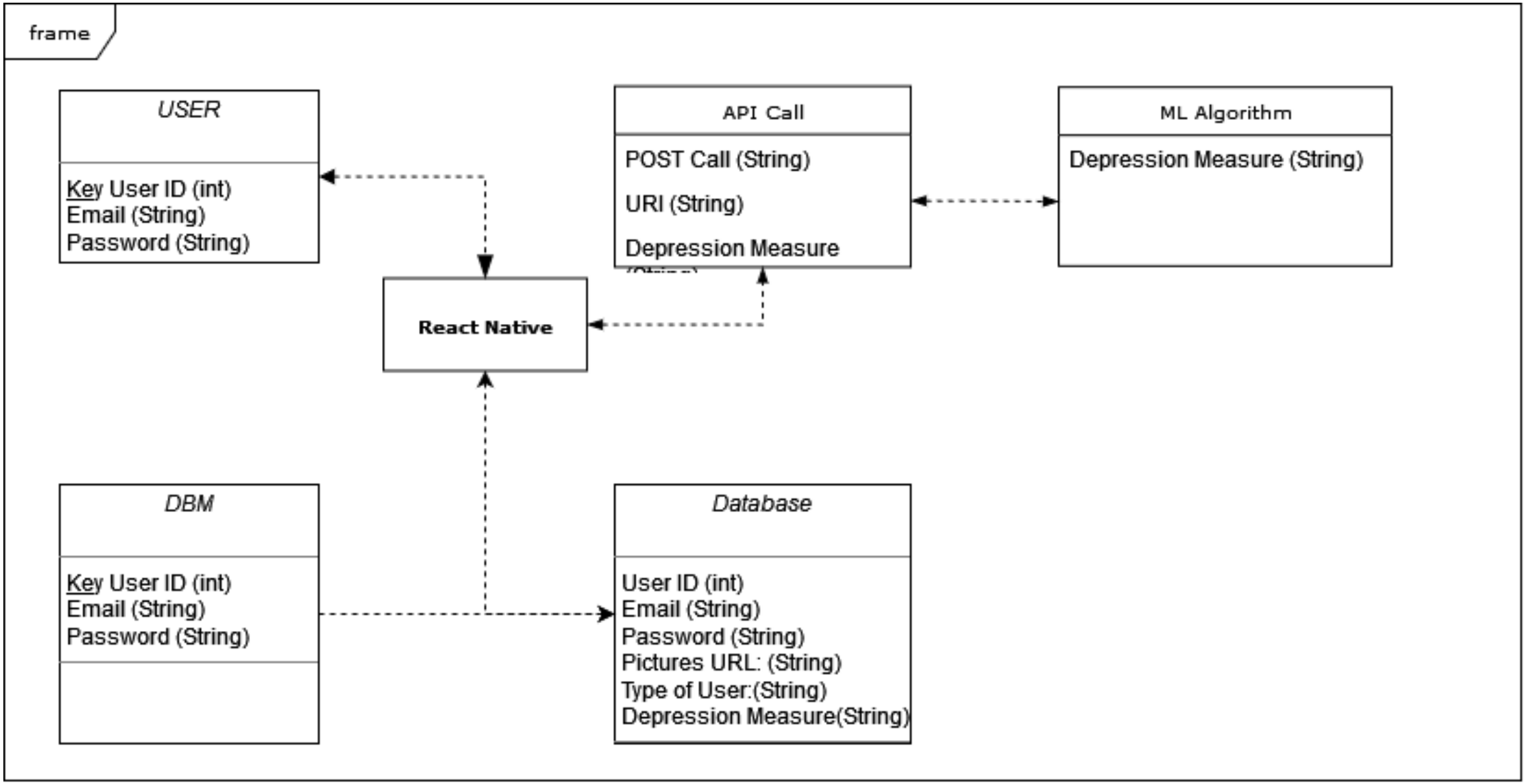
StressOut

StressOut

SEQUENCE DIAGRAM



UML CLASS DIAGRAM



StressOut

MACHINE LEARNING API

- API ready to deploy
- Setting up Render environment
- Solving Libraries incompatibility
- Deploy the API

StressOut

StressOut

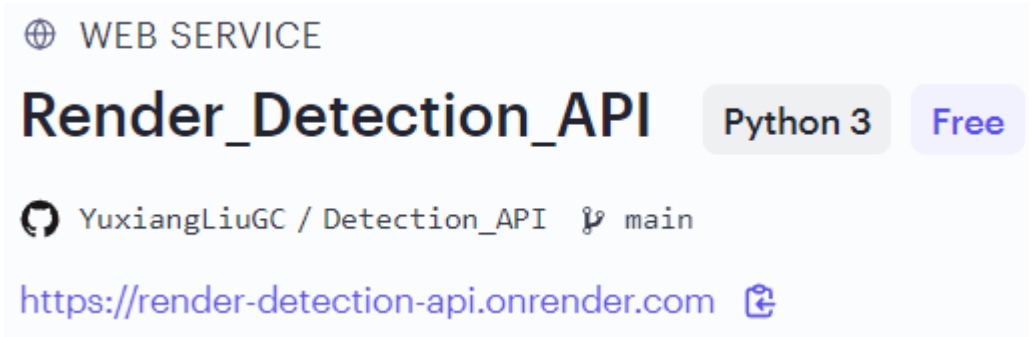
MACHINE LEARNING API

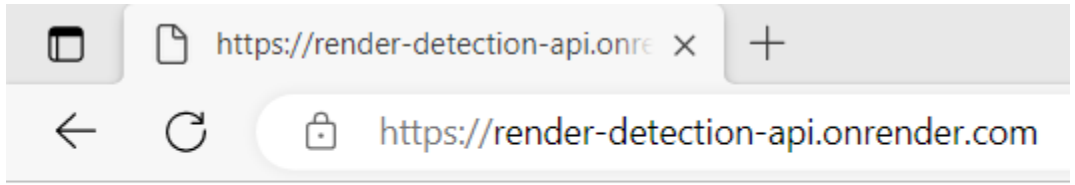
```
Sep 25 03:13:04 PM  ==> Uploading build...
Sep 25 03:13:48 PM  ==> Build uploaded in 24s
Sep 25 03:13:48 PM  ==> Build successful 🎉
Sep 25 03:13:50 PM  ==> Deploying...
Sep 25 03:14:32 PM  ==> Using Node version 14.17.0 (default)
Sep 25 03:14:32 PM  ==> Docs on specifying a Node version: https://render.com/docs/node-version
Sep 25 03:14:36 PM  ==> Running 'uvicorn model_API:app --host 0.0.0.0 --port 10000'
```

```
Sep 25 03:14:50 PM  ==> Detected service running on port 10000
Sep 25 03:14:50 PM  ==> Docs on specifying a port: https://render.com/docs/web-services#port-detection
Sep 25 03:14:52 PM  INFO:     Started server process [52]
Sep 25 03:14:52 PM  INFO:     Waiting for application startup.
Sep 25 03:14:52 PM  INFO:     Application startup complete.
Sep 25 03:14:52 PM  INFO:     Uvicorn running on http://0.0.0.0:10000 (Press CTRL+C to quit)
```

StressOut

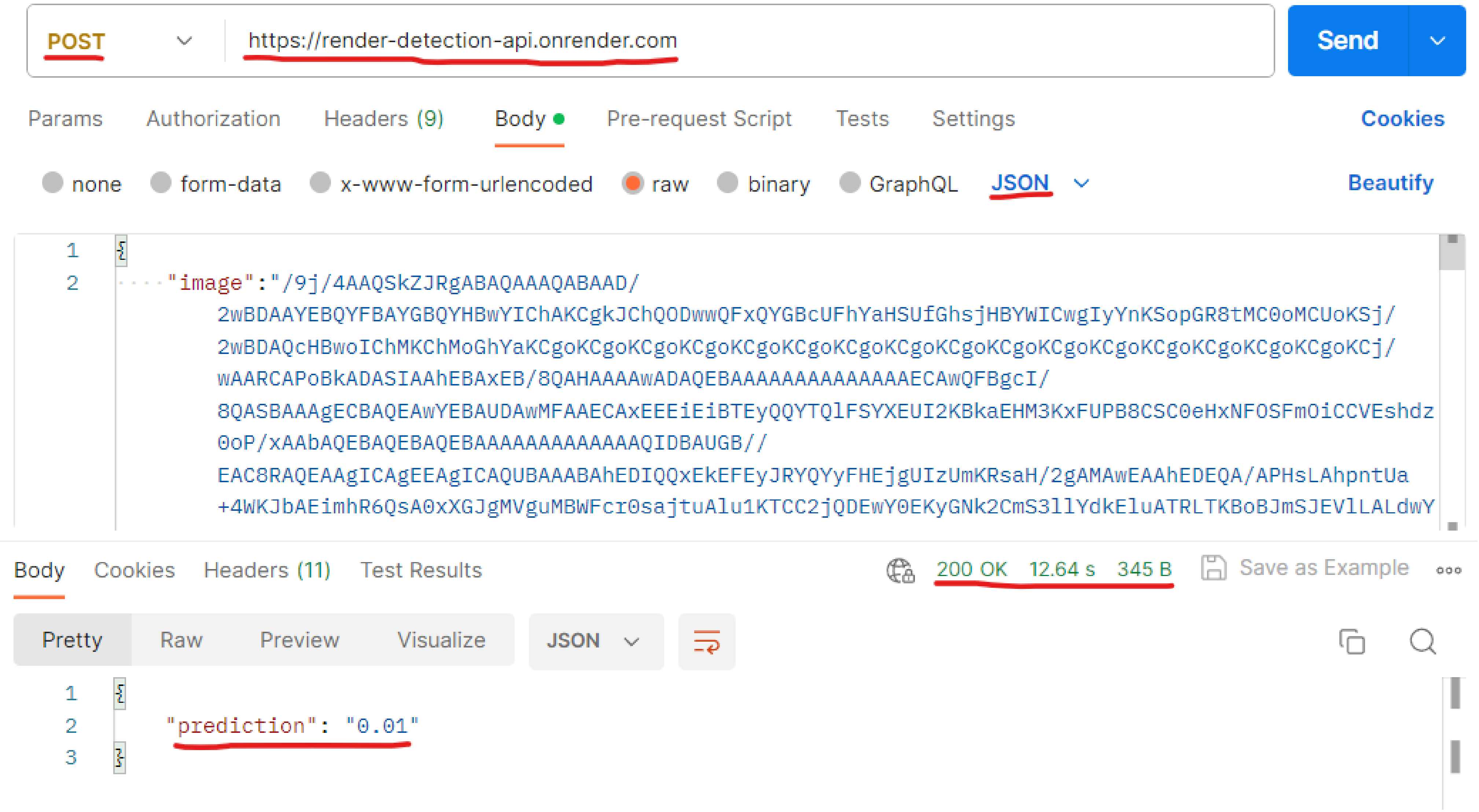
MACHINE LEARNING API





{"Hi there":"You reached the endpoint!"}

MACHINE LEARNING API



SPRINT 5 RECAP

Issue type	Key	Name
STRES-36	task	Implemented a functionality to the app that permits users to upload images.
STRES-39	story	As a user, I would like the ability to upload images to save them and assess my depression levels.
STRES-48	story	As a user, I want guidance on the ways to prevent my depression from worsening.
STRES-50	task	Connected App with firebase Storage where the raw images uploaded by the users were stored.

PRODUCT BACKLOG

StressOut

User Stories		
Key	Summary	Place
STRES-19	As a user, I want to register myself to the application. So that I can keep my account private and login using email/phone and password.	Home Page
STRES-20	As a user, I want to login in app. So that I can use it to store all my information.	Home Page
STRES-42	As a user, I want to upload my picture from phone gallery to analyze so that get more accurate information.	Image Upload/Take Picture
STRES-22	As a user, I want to take a picture from my front and back camera to upload so that the app can analyze	Image Upload/Take Picture
STRES-23	As a user, I want to view my upload history and their results	Profile/History of consultation
STRES-24	As a signed in user, I want to log out So that I can have my privacy in the app.	Logout/Login
STRES-25	As a user I want to be able to find contacts for professional help	Recommendation
STRES-26	As a user I want to be able to view history of my recommendation	Recommendation
STRES-27	As a user, I want to create my profile So that I can store my account information.	Profile/History of consultation
STRES-28	As a user, I want to be able to edit my information detail	Profile/History of consultation
STRES-29	As a user I want to be able to add captions for pictures I have uploaded	Image Upload/Take Picture
STRES-30	As a user, I want to be able to view personalized tips and strategies for managing symptoms	Recommendation
STRES-31	As a user, I want to know the sign of depression, and the risk of depression	Recommendation
STRES-48	As a user, I want to link to the hospital so that I can make a appointment with doctor	Recommendation
STRES-52	As a user, I want the app to keep checking my depression level so that I know when my depression level is worse	Profile/History of consultation
STRES-34	As a user, I want to know the risk of depression about me after I take pictures	Image Upload/Take Picture
STRES-35	As a user, I want to know some tips for relieving depression so that I can become better	Recommendation

SPRINT 6 BACKLOG

Key	Name	Story points
STRES-60	Finish API deployment for ML model	5
STRES-61	Finish application's deployment manual	5
STRES-48	As a user I want to see updated, modern UI with matching colors and all visible buttons	7
STRES-57	As a user I want receive feedback from ML model within 5 seconds period	3
STRES-62	As a user I want to track results of quizzes in real time	5

StressOut

STORIES AND ACCEPTANCE CRITERIA

Scenario	User Story	Status
1. customers want to see their pictures **Given** I'm in the role of customer **When** I open the profile screen **And** I click the update button **Then** the user can update the details	**As** a customer **I want** to update my details on the app **so that** I can see how I've changed these days	Done
2. customers want to see their past result **Given** I'm in the role of customer **When** I open the history page **Then** I want to see the quiz result I took before **And** I click the quiz result **Then** I can see the grades and date	**As** a customer **I want** to check my grade of the quiz **so that** I can know my depression level at that time	Done
2. customers want to see their results 5 seconds faster **Given** I'm in the role of customer **When** I open the uploading image page **Then** I want to see the results quicker than 6 seconds **And** I click the on the save results **Then** I can see the results faster than 6 seconds	**As** a customer **I want** to check my grade of the quiz faster than 6 seconds **so that** I can know my depression level at that time	Done

StressOut

TEST CASES

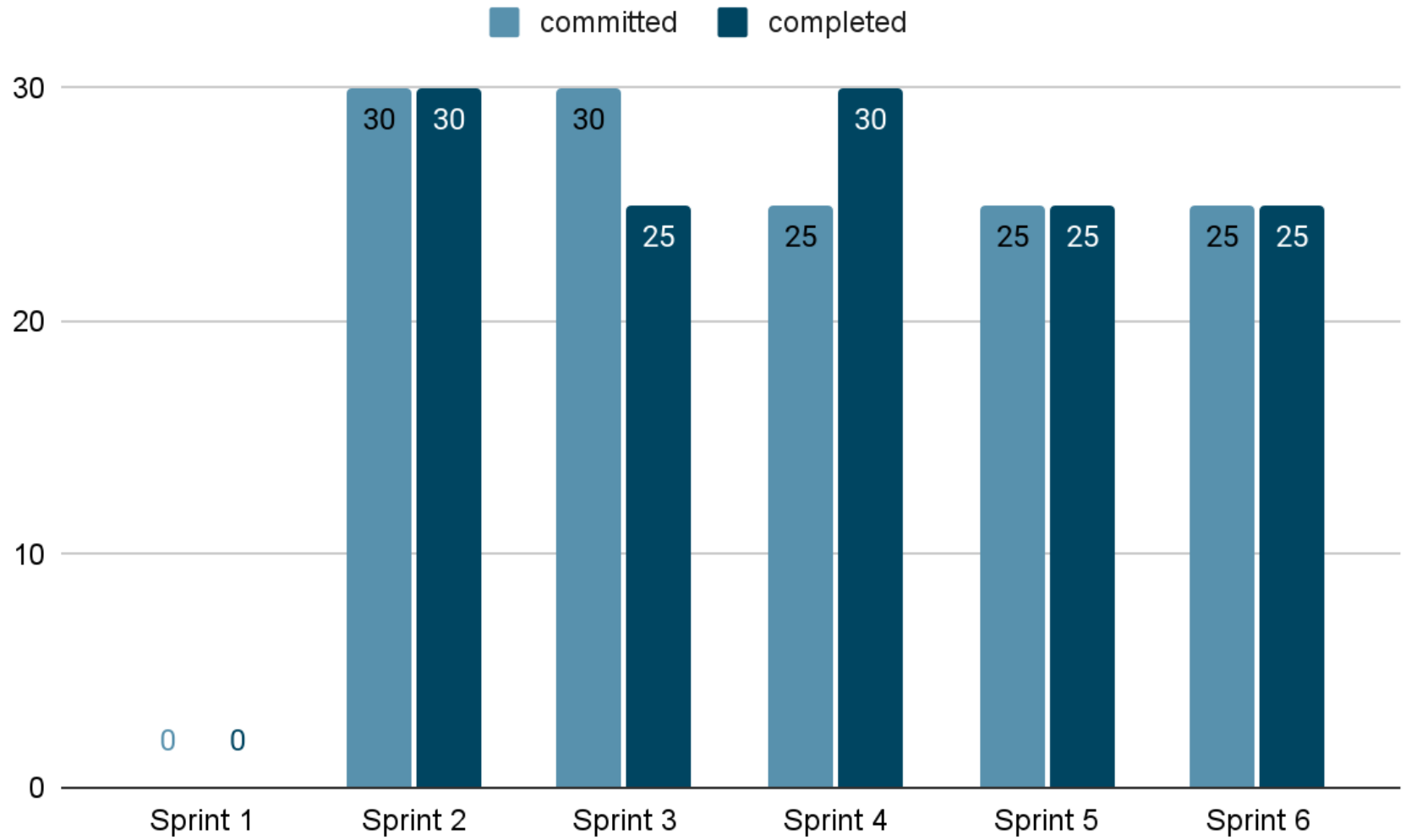
Test case for	Key	Test case id	Test data	Expected results	Actual results	Pass/fail
User portal	STRES-60	Test-73	email:test@gmail.com password:test123	Customers can add details on user information	Click the button, the page show update successful	P
User portal	STRES-60	Test-74	email:test@gmail.com password:test123 one of the photo from phone	Customers can select document from the phone and upload	Select the document, click the upload button, show upload successful	P
History page	STRES-59	Test-65	email:test@gmail.com password:test123 one of the photo from phone	Customers can check their pictures	Click the history and click pictures, show all the previous pictures	P
History page	STRES-59	Test-62	email:test@gmail.com password:test123 quiz grade	Customers can check the past result	Click the history and click other details, show the previous quiz grade	P
Take picture page	STRES-55	Test-64	email:test@gmail.com password:test123	After customers take pictures, pictures will be stored and found	Take the picture, it showed in history and can be found in firebase storage	P

COMPLETED AND NOT COMPLETED STORIES

Key	Name	Status
STRES-60	Finish API deployment for ML model	Done
STRES-61	Finish application's deployment manual	Done
STRES-48	As a user I want to see updated, modern UI with matching colors and all visible buttons	In processing
STRES-57	As a user I want receive feedback from ML model within 5 seconds period	Done
STRES-62	As a user I want to track results of quizzes in real time	Done

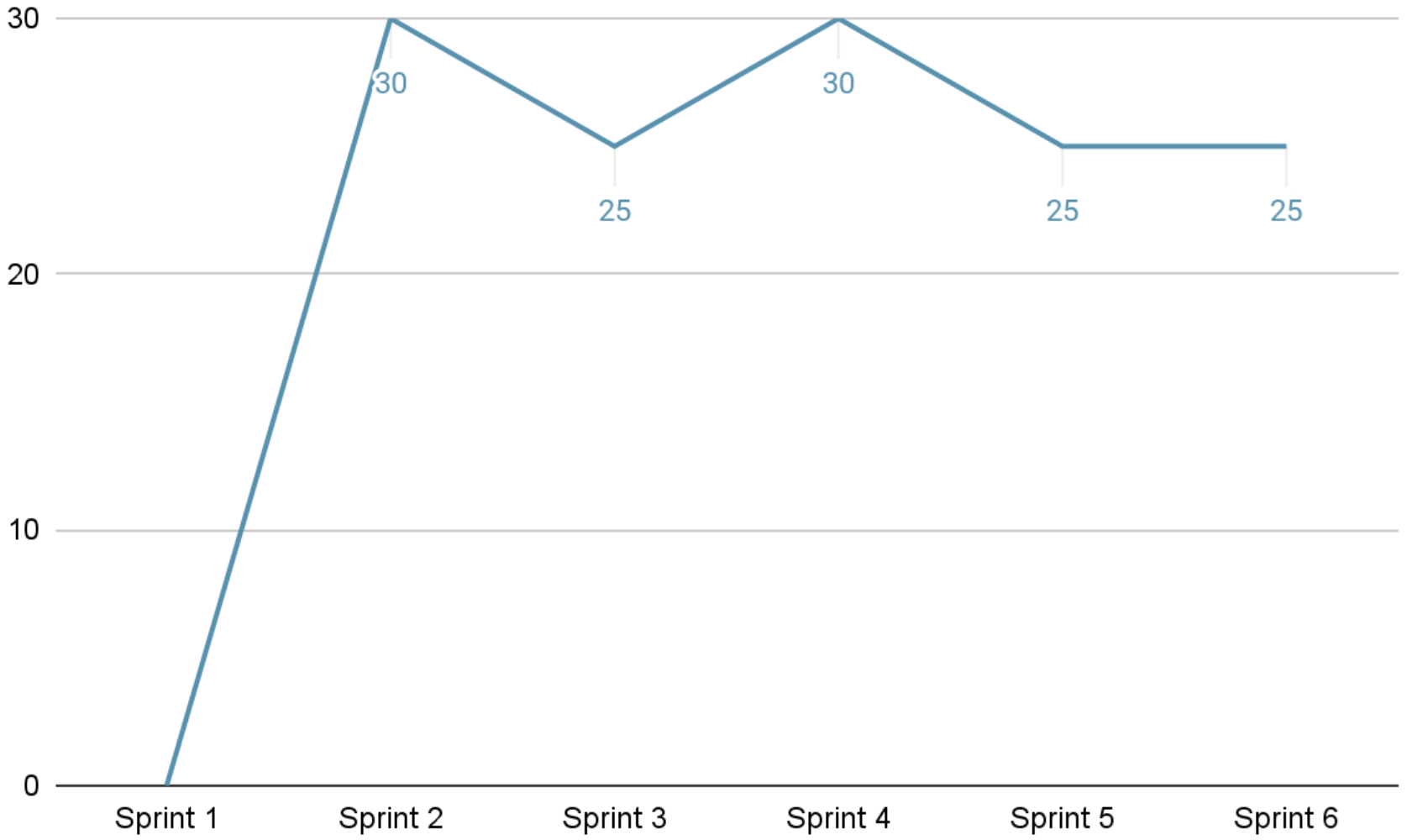
StressOut

TEAM VELOCITY



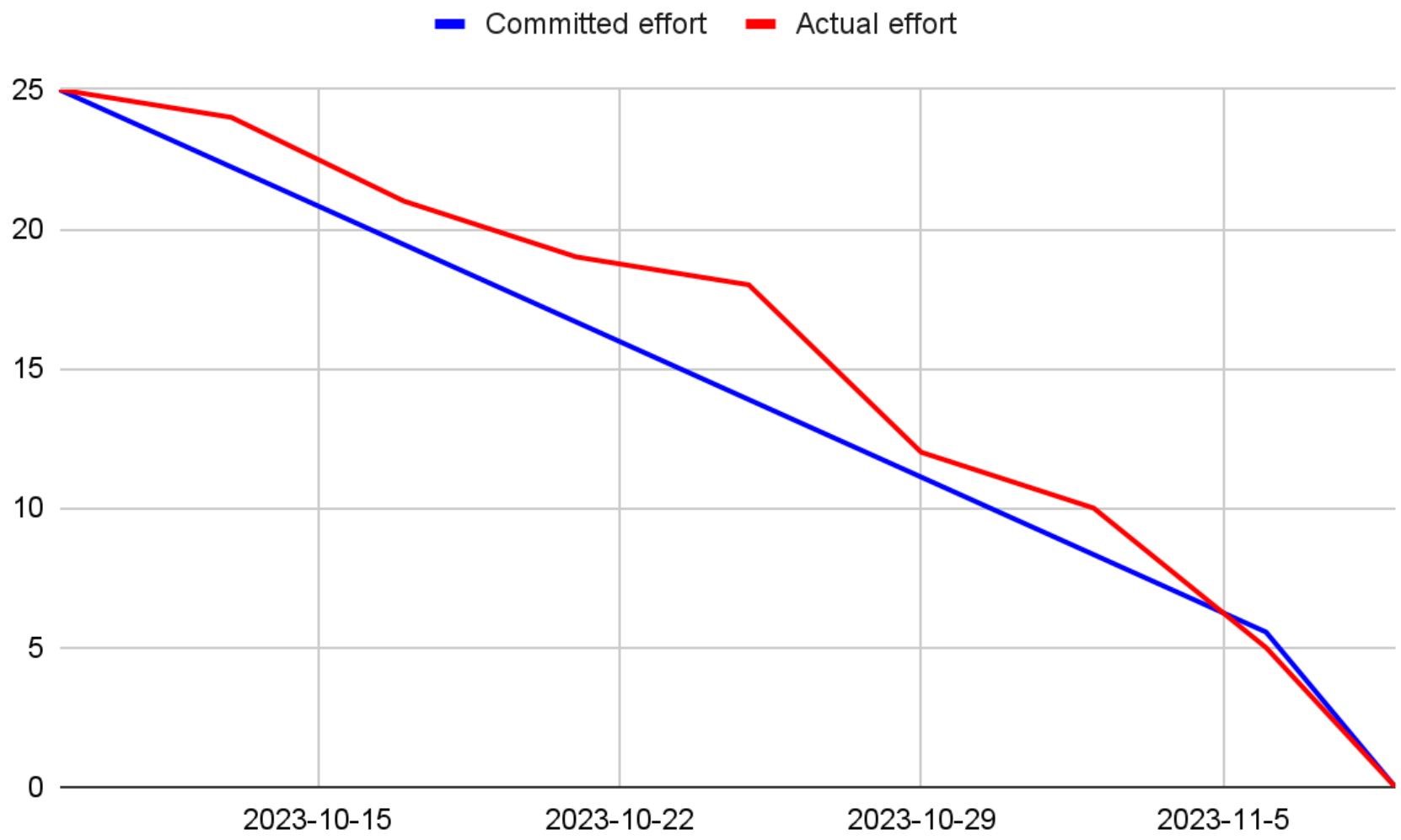
TEAM'S HISTORICAL VELOCITY (AVERAGE)

StressOut



StressOut

SPRINT 6 BURNDOWN CHART



APP SCREENSHOTS

Home Page

App has 5 Functionality Buttons

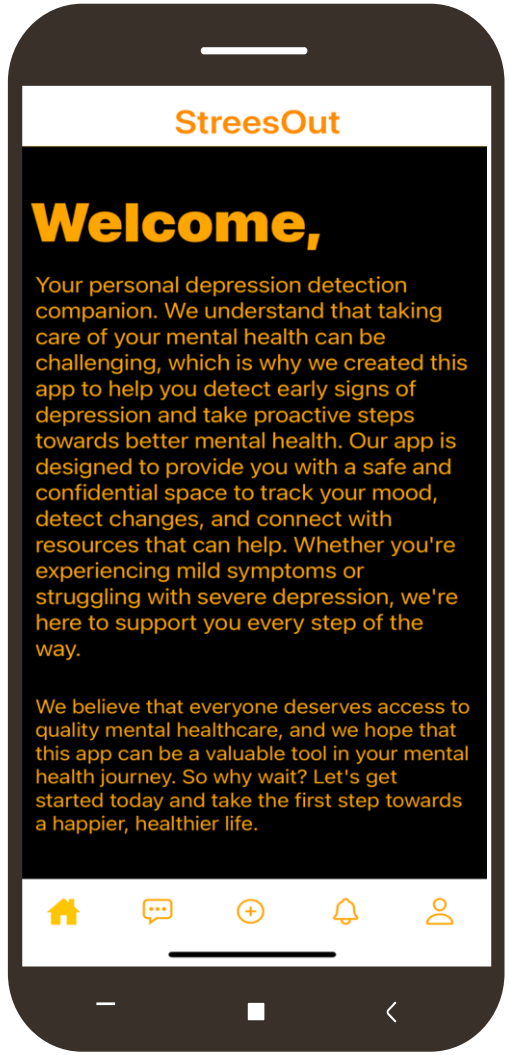
Onboarding Screen: A screen that welcomes the user to the app and provides an overview of its app.

Stress level analysis screen: A screen that displays the user's stress level based on the biometric data collected.

Quiz / Upload Images Screen: Quiz screen that asks the user questions to identify their sources of stress. Upload screen that allows the user to upload images

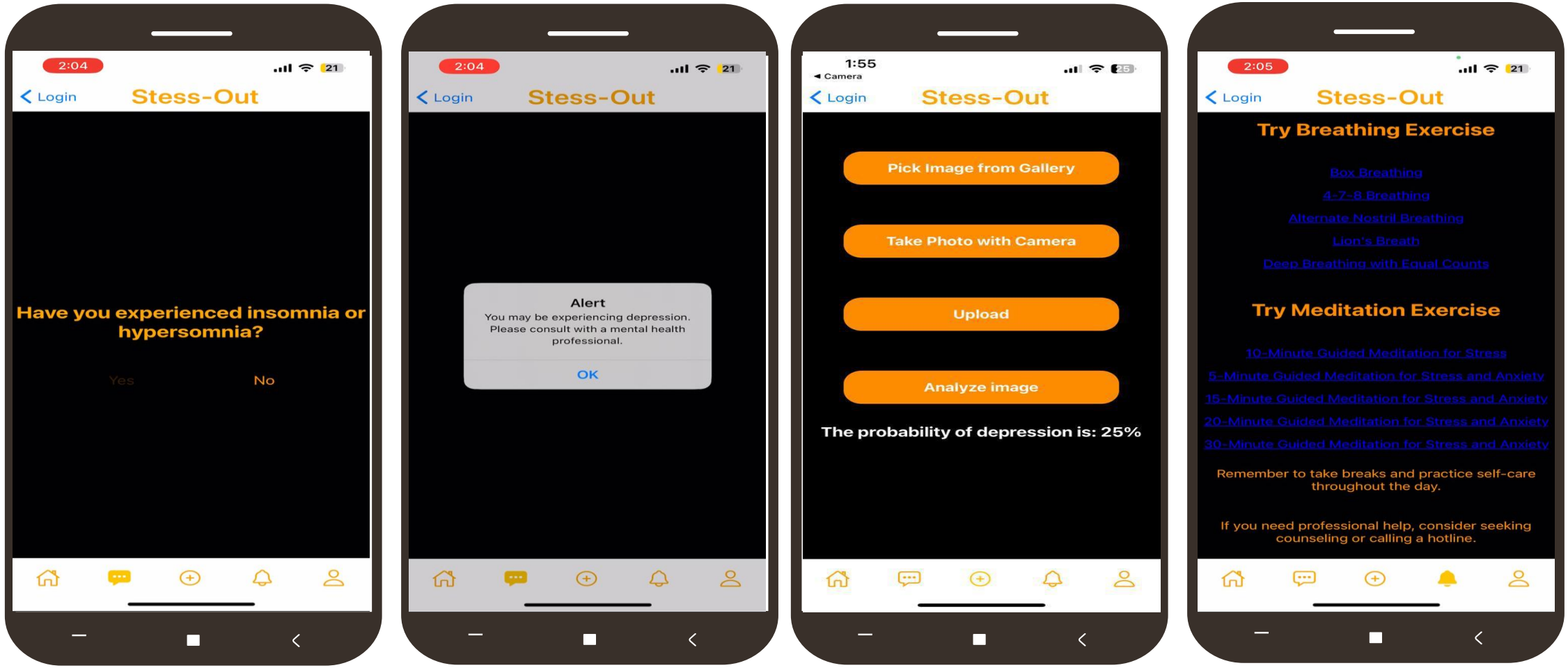
Stress management techniques Screen: A screen that provides stress management techniques, such as breathing exercises, meditation, or cognitive behavioral therapy.

Registration / Login Screen: A screen that allows the user to create an account or log in to an existing one.



StressOut

APP SCREENSHOTS



StressOut

USER DETAILS

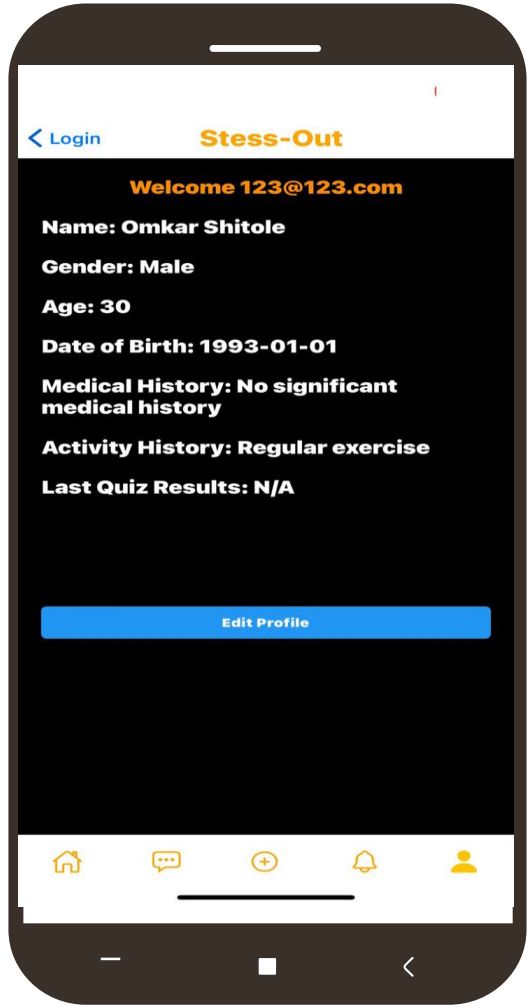
Profile Screen

In this screen user can edit and save profiles information like name, gender, age, DOB, medical history, and activity history.

User quiz results are saved in real-time to a Firestore database as part of their profile data.

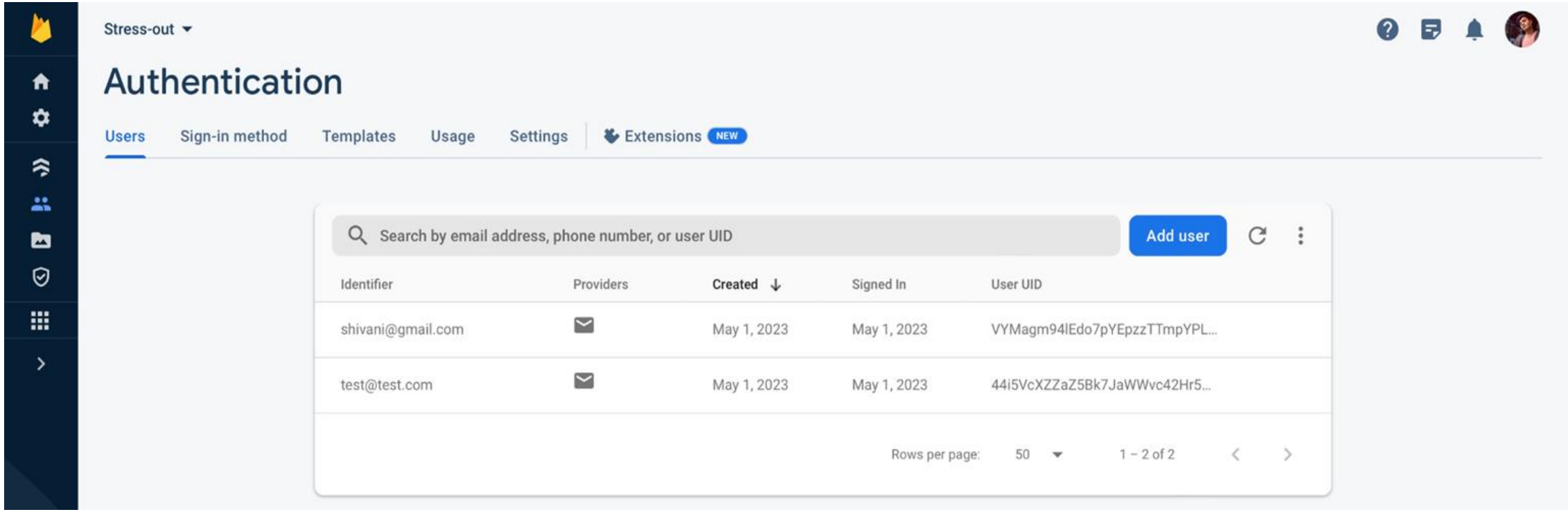
The app's profile screen provides a comprehensive overview of the user's personal information and quiz results, aiding in stress assessment.

By combining facial recognition technology and profile data storage, the app aims to offer effective stress detection and management.



StressOut

FIREBASE AUTHENTICATION



When a new user creates an account using Firebase Authentication in our app, the user's email address and a unique user ID (UID) are automatically generated and stored securely in the Firebase Authentication server.

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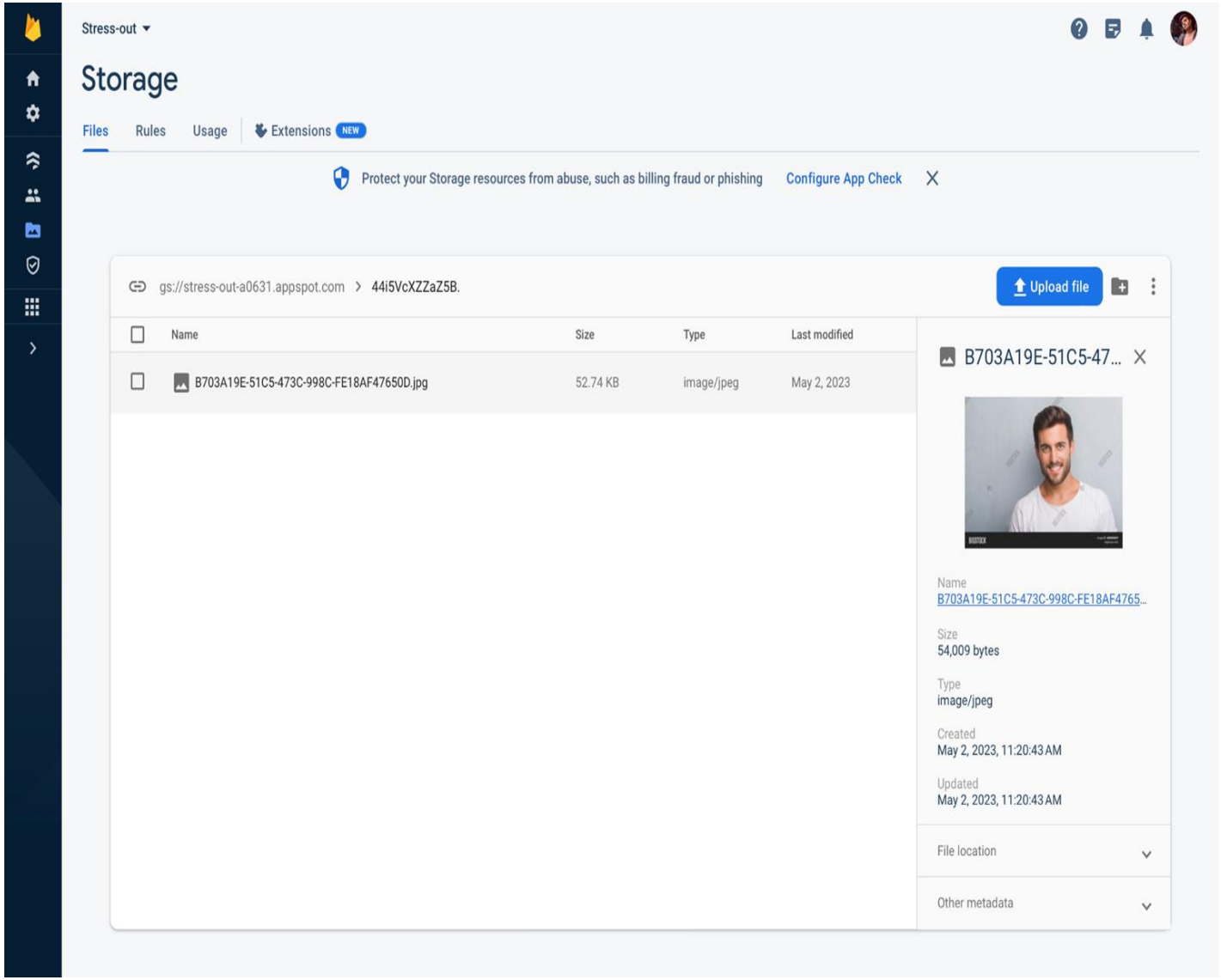
FIREBASE AUTHENTICATION



When a user uploads or takes a picture in our app, the image is stored in Firebase Storage using the Firebase Storage client SDK. To maintain a separation between different users' data, we create a separate folder for each user in Firebase Storage, with the user's UID associated with that folder. This ensures that each user's data is stored in separate location. Firebase Storage generates a unique URL for each file that is stored, which can be used to retrieve the file later.

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SPRINT 6 SCHEDULE

Issue Type	Key	Name	Status	Story Point Estimate
Story	STRESS-59	As a user, I want to track what my mood was last month/year	to be done	5
Story	STRESS-70	As a applicant, I would like to use a dashboard that displays any recommendations based on my self-assessment results	To be done	5
Story	STRESS-72	Update technical paper.	To be done	3

RETROSPECTIVE

What went well: Team quickly responded professor's criticism of our sprint 5 deliverables. Each member evaluated their own pitfalls and made corrections accordingly.

What needs improvement: We need to improve our production speed to introduce all necessary features. There are still some features left for last sprint

Next Steps: With preparation for next sprint, we have to make sure all part of our application works as expected.

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THANK YOU

Wiki page link

Updated Technical Paper

Deployment Manual Link