



Every Child is Special



AI-based Personalized Rehabilitation for Dyslexia and Dyscalculia Adolescents

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Like
stars
on Earth

EVERY CHILD
IS SPECIAL

CONTENT

1. Introduction
2. Research Question
3. Research Gap
4. Proposed System
5. Technologies
6. Domain Expertise and data requirement
7. Individual Components
8. Commercialization Aspects
9. Budget





INTRODUCTION



Most children have no idea
how they are supposed to see.
So when words look like this,
they assume everyone sees
the same way.



Learning Disabilities

Dyslexia

- Reading Challenges
- Writing Challenges

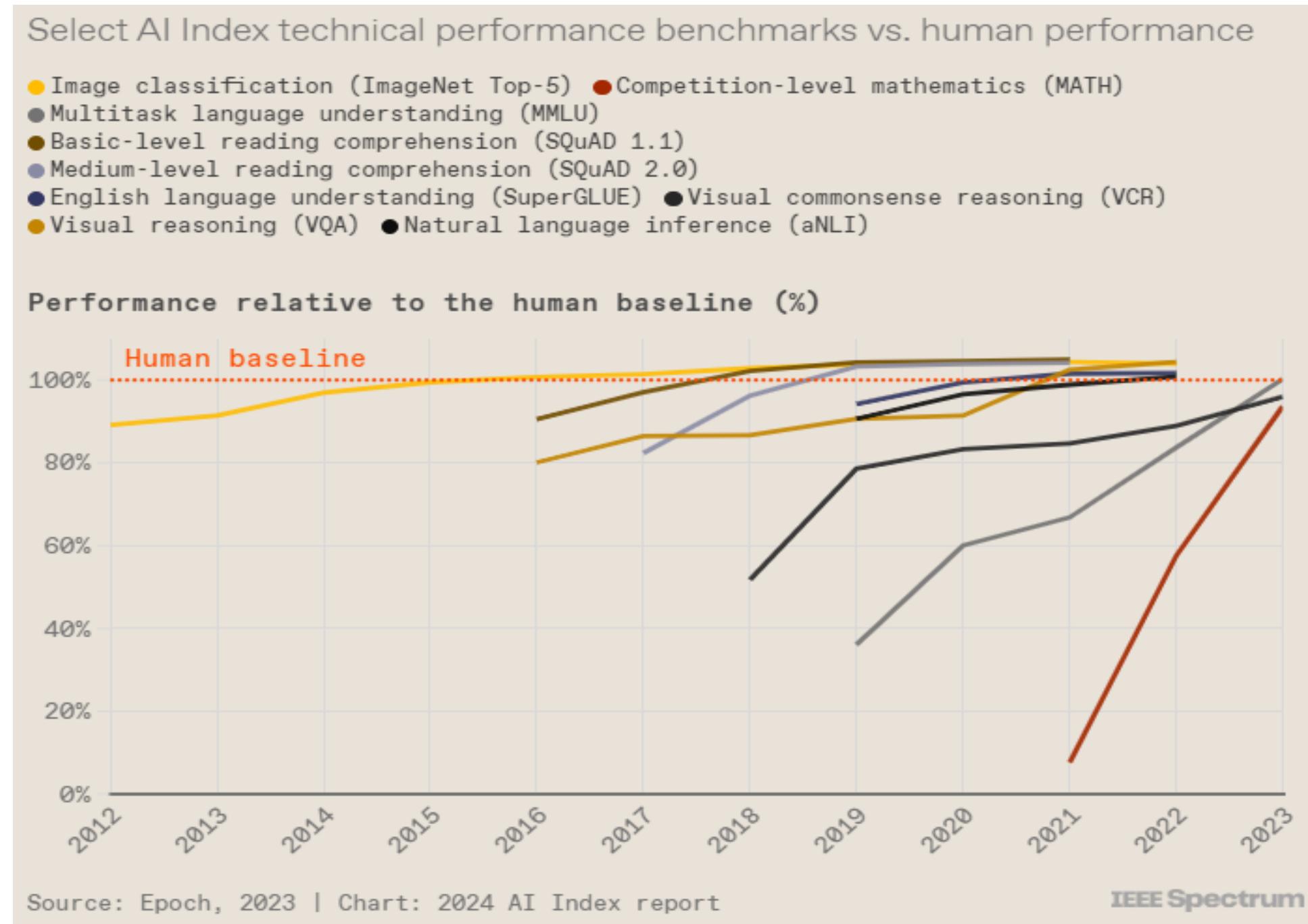
Dyscalculia

- Number Challenges
- Arithmetic Challenges
- Spatial Challenges

Grade	Multiple Impairments		Hearing Impairments		Visual Impairments		Speech Language Difficulties	Dyslexia	Intellectual Impairments	Physical Disabilities	Epilepsy	Emotional Problems	Other	Total											
			Complete	Half	Complete	Half																			
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F									
Grade 1	327	202	15	12	41	39	19	6	386	297	454	172	149	81	417	251	145	106	50	27	217	55	100	63	2320
Grade 2	258	170	16	14	58	55	24	11	485	394	410	179	172	86	510	271	148	111	50	36	263	65	84	69	2478
Grade 3	279	169	8	14	68	52	25	15	663	626	358	139	283	141	571	311	159	98	57	33	265	73	100	61	2336
Grade 4	256	135	9	13	80	47	37	13	736	652	304	149	291	141	609	356	173	95	60	34	224	72	97	65	2876
Grade 5	197	166	17	11	59	63	23	23	690	704	230	94	255	148	533	304	139	95	42	42	233	64	87	42	2505
Grade 6	138	108	10	12	88	52	25	15	600	745	155	46	303	133	403	196	127	83	48	30	212	54	92	62	2261
Grade 7	135	58	6	15	71	60	29	14	792	893	158	50	227	113	345	167	117	74	55	30	192	51	78	49	2205
Grade 8	107	59	11	11	60	78	23	16	904	942	128	54	203	68	323	159	120	70	53	39	239	59	71	40	2242
Grade 9	67	46	12	9	63	51	24	18	716	1020	96	44	226	102	294	132	106	77	40	31	184	52	71	35	1899
Grade 10	71	30	6	6	54	41	30	18	636	931	74	32	162	72	198	134	98	77	26	32	184	54	45	32	1584
Grade 11	42	25	12	12	44	36	10	18	613	736	54	29	120	52	170	114	64	74	19	24	135	36	33	23	1316
Grade 11 (Repeaters)	1	2	0	1	2	4	2	0	39	42	5	1	6	3	5	8	5	4	2	0	2	1	3	3	72
Total	1878	1170	122	130	688	578	271	167	7260	7982	2426	989	2397	1140	4378	2403	1401	964	502	358	2350	636	861	544	24534

Disability among Students in General Class and Government Schools, Recorded in the Year 2019

WHY NOT A TECH SOLUTION?



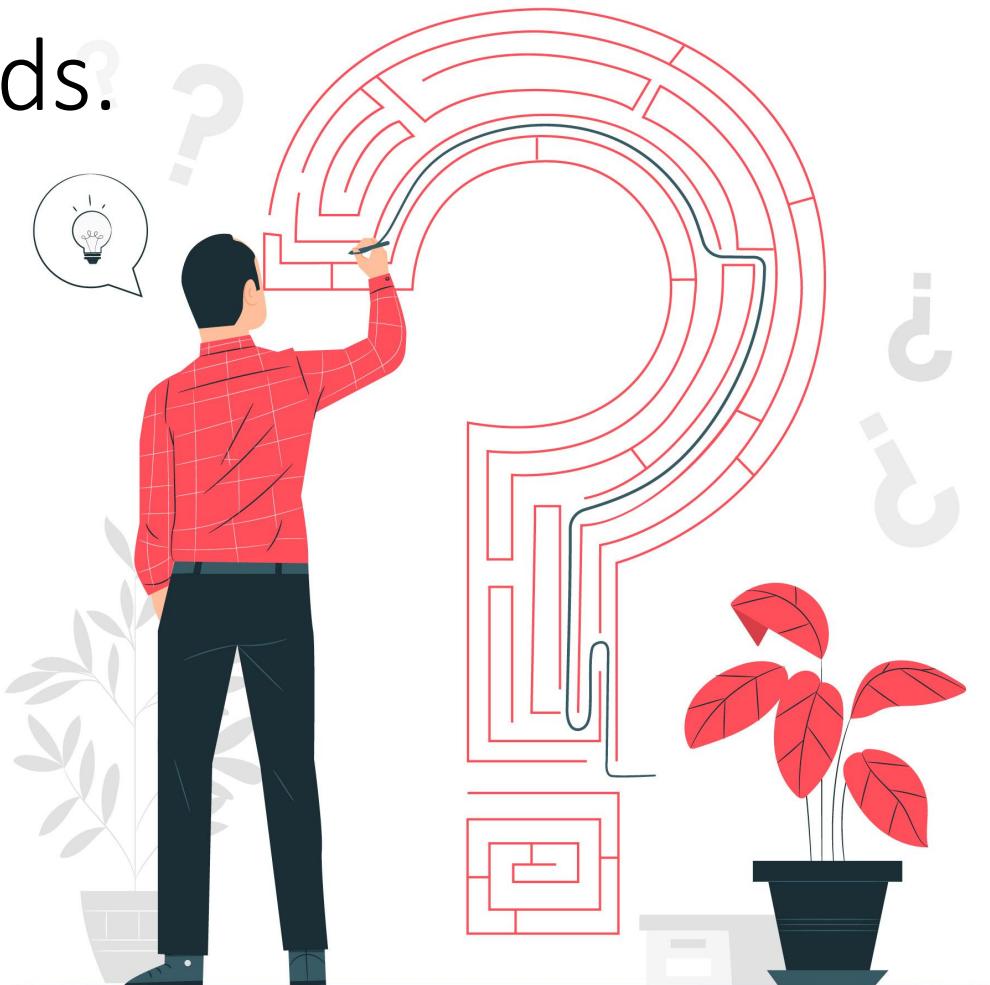
Select AI Index technical performance benchmarks vs. human performance



RESEARCH PROBLEM



- Lack of adaptive educational lessons
- Need for systems that detect emotional and engagement cues.
- Need for personalized and multisensory teaching methods.
- Need for audio adjusting features.





OBJECTIVES



Develop a personalized assistive learning platform for children with dyslexia and dyscalculia



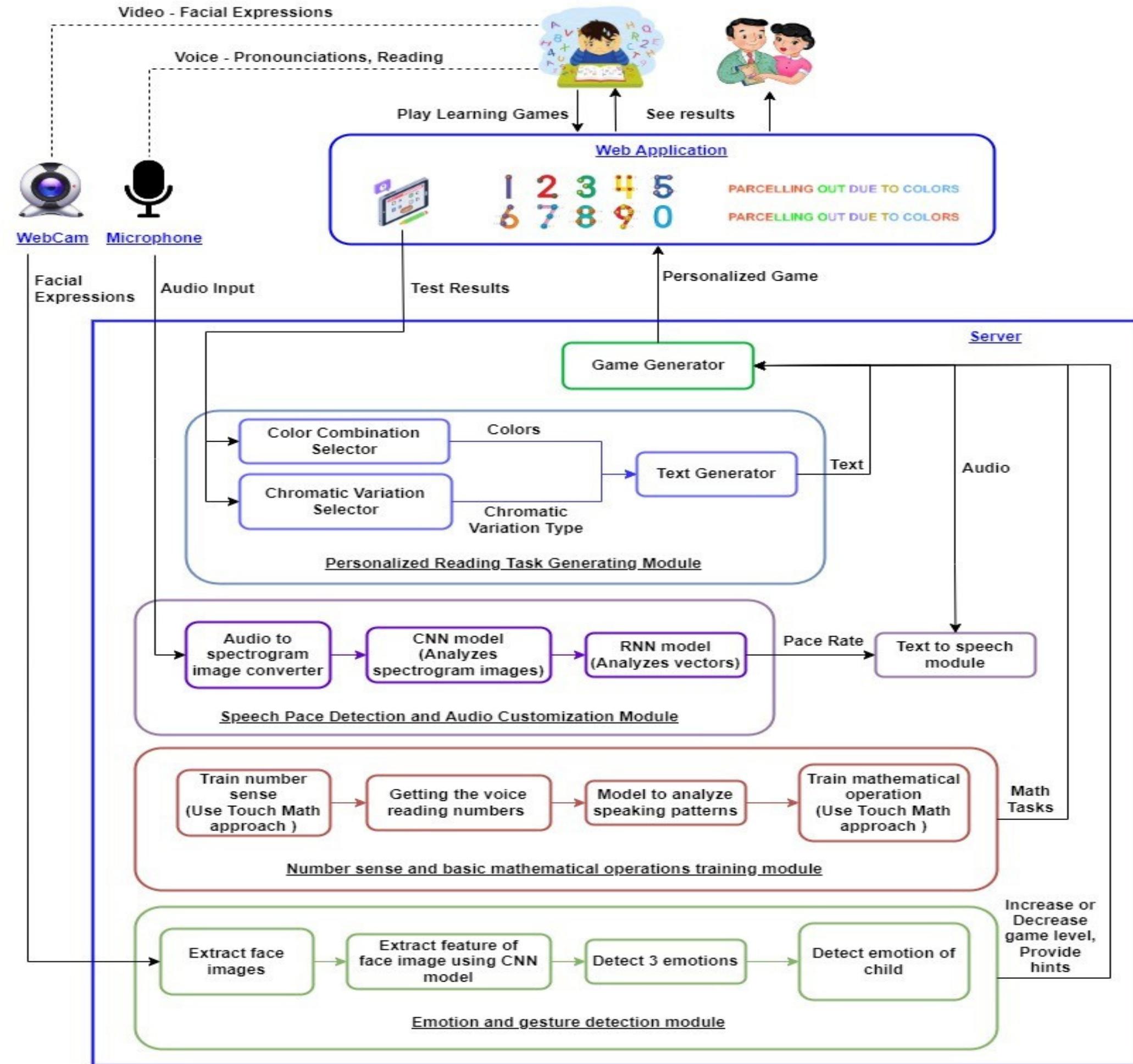
Sub Objectives



- Enhance reading skills using color variations.
- Implement personalized audio output based on speech pace detection.
- Improve mathematical skills using the Touch Math approach.
- Use real-time emotion detection to adapt tasks dynamically and provide supportive guides.



SYSTEM OVERVIEW DIAGRAM





SOFTWARE DEVELOPMENT PROCESS

Software Development Life Cycle



3 Implementation

- Break down user stories into tasks
- Assign tasks to team members
- Develop code according to architecture
- Conduct unit tests and code reviews

4 Testing

- Perform functional testing
- Execute integration tests
- Conduct regression testing
- Gather feedback and adjust.



Deployment 5

- Prepare deployment plan
- Perform system deployment
- Monitor initial deployment issues.

2 Design

- Create wireframes and prototypes
- Develop system architecture
- Plan database schemas and data flow
- Design user interface specifications

1 Requirement Gathering and Analysis

- Collect user stories and requirements
- Define acceptance criteria
- Analyze feasibility and risks
- Prioritize backlog items

Maintenance 6

- Resolve issues and bugs
- Implement user feedback changes
- Ensure regular updates and improvements



Project Management Dashboard

The screenshot shows a Trello board titled "Bsc Research". The left sidebar includes options for Boards, Members, Workspace settings, Workspace views, Table, Calendar, and Your boards. The main board has four columns: Product Backlog, Current Sprint, In Progress, and On Hold. The "Current Sprint" column contains the following cards:

- data collection phase 2
- progress presentation 1
- train emotion model again
- Identify emotion class
- Testing and fine tuning the models.

Each card has a "Add a card" button at the bottom right. The "On Hold" column contains the following cards:

- Initial Research Paper Draft
- Ethical clearance form completion
- Knowledge Gathering
- Proposal Presentation 1
- integrating github project

Each card has a "Add a card" button at the bottom right. The "Done" section on the right lists several completed tasks, each with a "Edit" icon.



Figma Prototype

Version Control - Github



LexAyudha / LexAyudha-API

Code Issues Pull requests Actions Projects Security Insights Settings

LexAyudha-API Private

main · 2 Branches · 0 Tags

Go to file Add file Code

About

No description, website, or topics provided.

Activity

Custom properties

0 stars 0 watching 0 forks

Releases

No releases published Create a new release

Packages

No packages published Publish your first package

README

Bsc Research | Trello | LexAyudha repositories | LexAyudha/LexAyudha-API | LexAyudha/LexAyudha-API

github.com/orgs/LexAyudha/repositories

LexAyudha

Overview Repositories 3 Projects Packages Teams People 4 Insights Settings

Repositories

All Public Private Sources Forks Archived Templates

All

Search repositories

3 repositories

Last pushed

TestRepo Private

0 · 0 · 0 · 0 · Updated 12 hours ago

LexAyudha-API Private

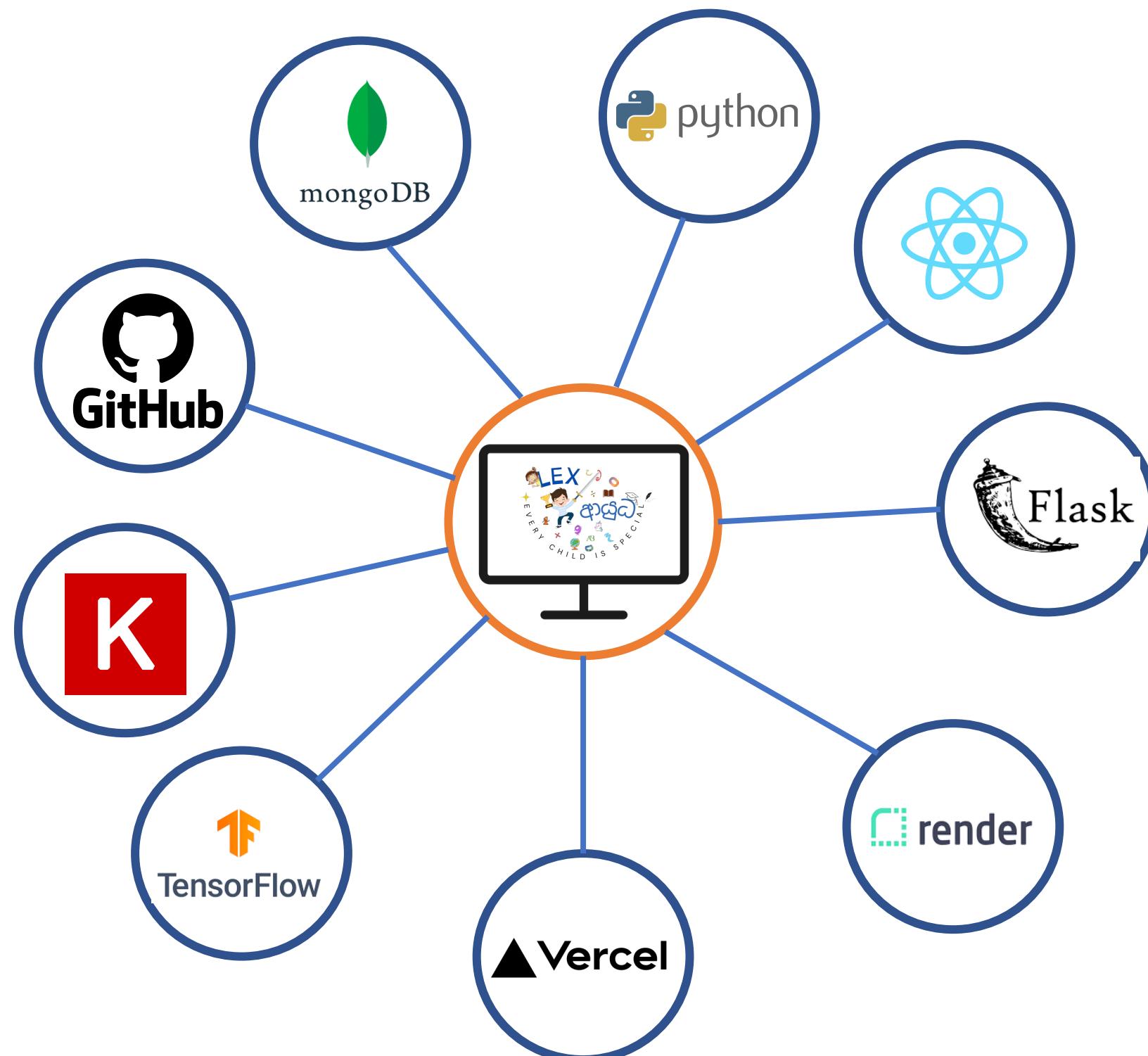
JavaScript · 0 · 0 · 0 · 0 · Updated 2 days ago

LexAyudha-FE Private

JavaScript · 0 · 0 · 0 · 0 · Updated 4 days ago



TECHNOLOGIES



Frontend

- React
- Ant Design

Backend

- Flask
- Node Js

Machine Learning and Deep learning

- Python
- Jupyter Notebook
- TensorFlow
- Keras
- OpenCV
- Keggale

Version Control and Project Management

- Github
- Trello

Technical Concepts

- Machine Learning
- Image Processing
- Convolutional Neural Network (CNN)
- Recurrent Neural Network (RNN)
- Containerization
- Microservices



INDIVIDUAL COMPONENTS



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EMOTION RECOGNITION TO PROVIDE REAL-TIME ADAPTIVE FEEDBACK AND ADJUST ACTIVITY DIFFICULTY LEVEL

Research Problem



- Real time emotion detection to reduce stress level
- Support student by dynamically changing the activity level
- Personalized Feedback to guardian with child's emotion status



Solution

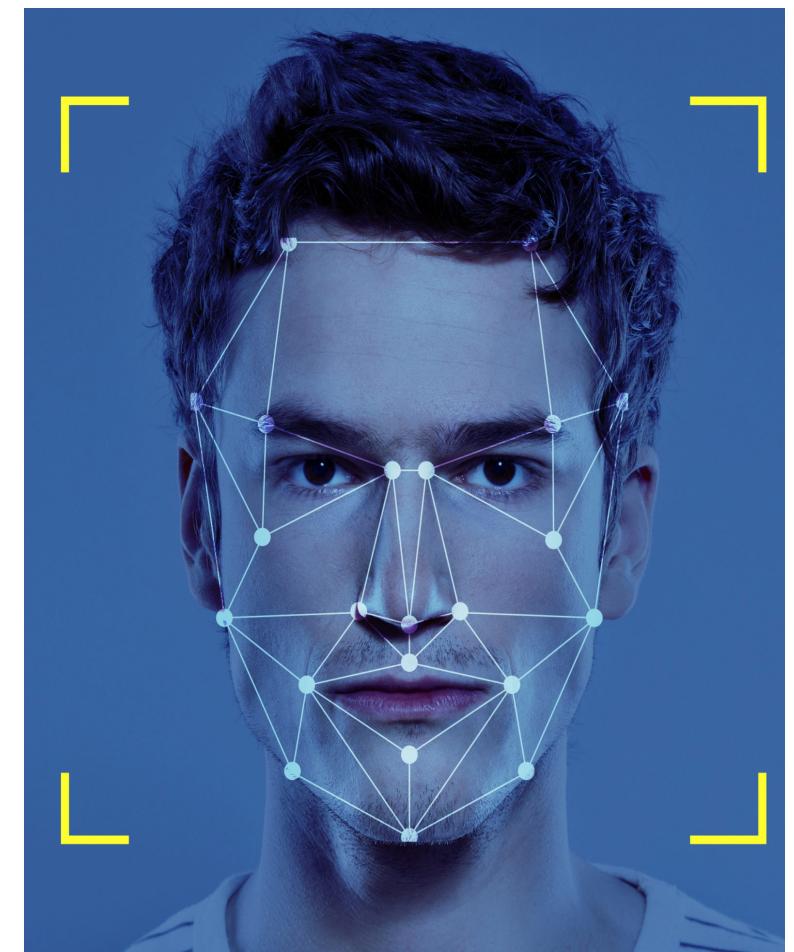


SPECIFIC OBJECTIVE

Emotion Recognition to provide real-time adaptive feedback and adjust activity difficulty level

SUB OBJECTIVES

- Detect emotion and identify the emotion class
- Dynamically change acitivity difficulty level
- Keep track of student emotional records with relevet activity
- Generate Personalized feedback for guardian



Objectives Cont.

Key Emotions (5):

1. Happiness
2. Sadness
3. Surprise
4. Anger
5. Neutral

Main Classes (3):

1. Distraction (extended period of neutral, surprise)
2. Frustration (sadness, anger)
3. Engagement (happiness, lower frequency of neutral/sadness)



Requirements



System Requirements

- ❖ Stable internet connection.
- ❖ High Definition Web Cam

Personal Requirements

- ❖ Consent to capture Video Data.
- ❖ Clear & Well lit environment.

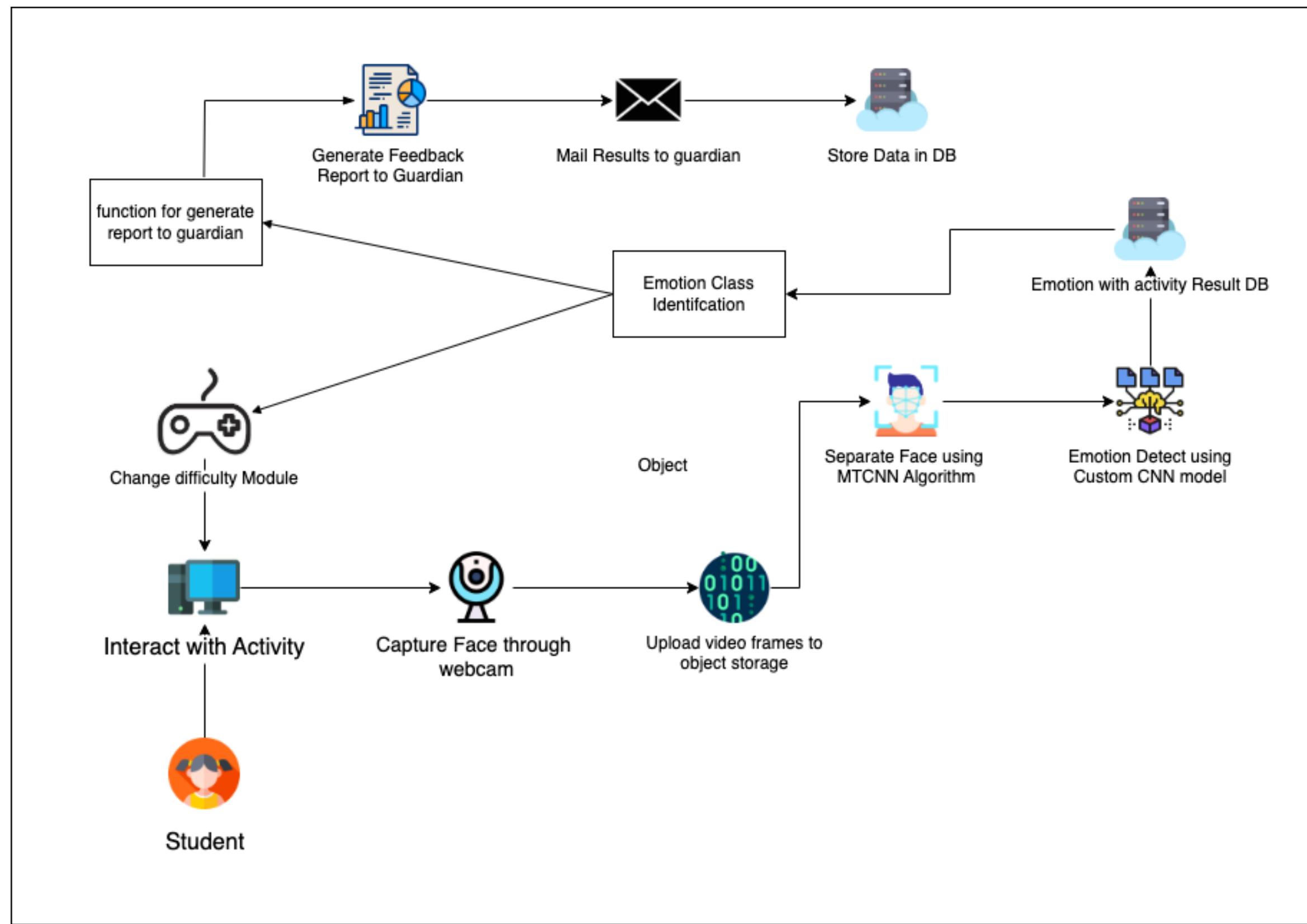
Software Requirements

- ❖ Web browser with WebCam access.

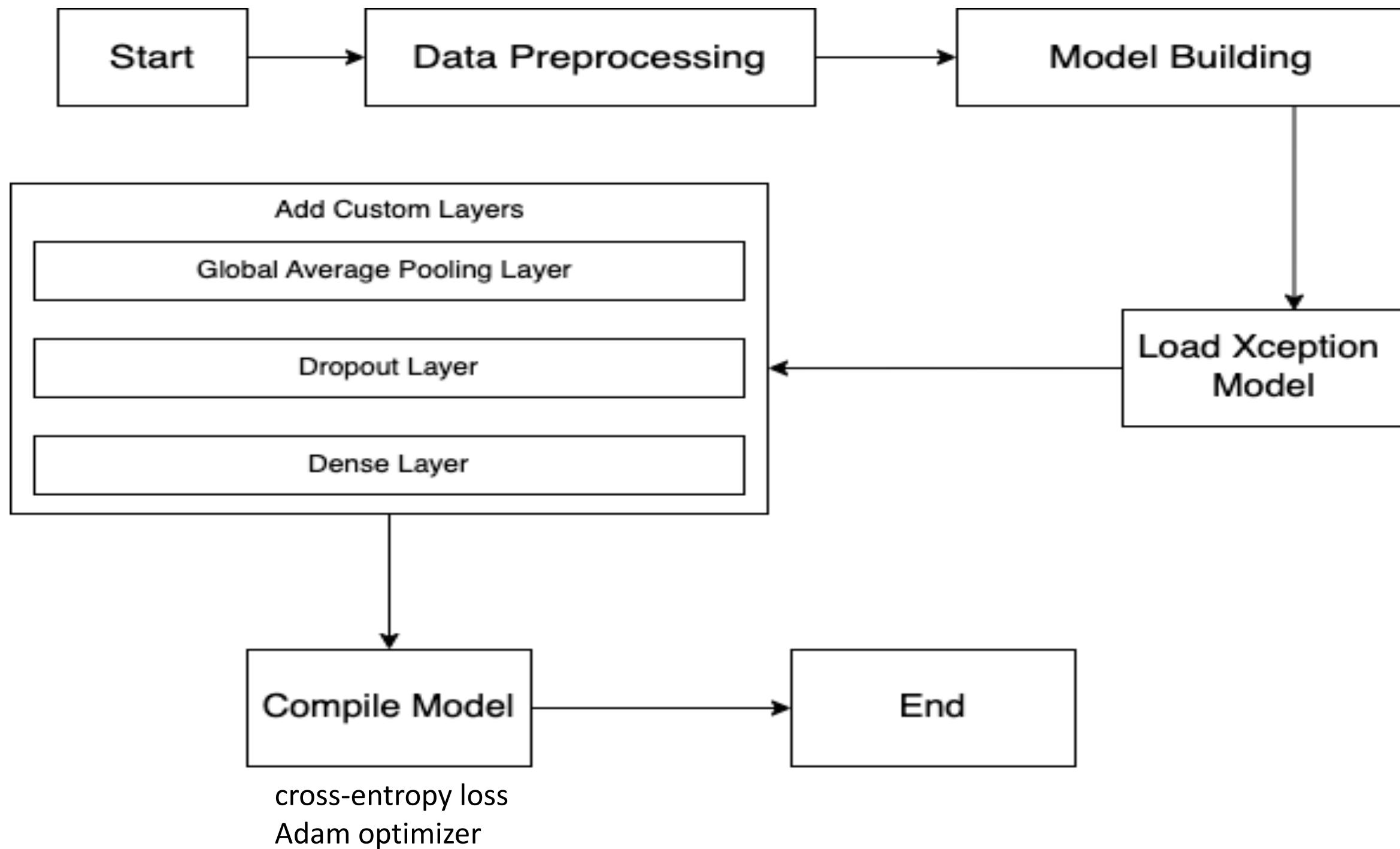
Functional Requirements

- ❖ User Logs in to system.
- ❖ Capture Video Realtime.
- ❖ Recognize facial emotions
- ❖ Dynamically change difficulty level
- ❖ Generate Personalized feedback report

System Diagram



Flow Chart - Model



Risk Mitigation

Identified Risks & Mitigation Strategies



Poor model training caused by unbalanced data.

Mitigate by mixing gathered training data with Kaggle dataset.

Guardian Engagement with the Feedback Report.

Mitigated by Simplify reports with clear visuals (e.g., pie charts)

Data Security Concerns

Encrypt all data during transmission and storage, ensuring compliance with privacy.

Connect NodeJS User management with flask backend

Mitigated by adding Microservice architecture For backend

Current progress

Overall completion - 55 %



- Detect emotion
 - ❖ model implementation – 100%.
 - ❖ model training – 80 %
- Determine Emotion Class
 - ❖ function to detect emotion class for given period of time – 90%
- Keep track of student emotional records with relevant activity – 100%

Evidence of Completion

Emotion Model Summary



Model: "model"		
Layer (type)	Output Shape	Param #
input_2 (InputLayer)	[None, 72, 72, 3]	0
xception (Functional)	(None, 3, 3, 2048)	20861480
global_average_pooling2d (GloballyAveragePooling2D)	(None, 2048)	0
dropout (Dropout)	(None, 2048)	0
dense (Dense)	(None, 7)	14343
<hr/>		
Total params:	20,875,823	
Trainable params:	20,821,295	
Non-trainable params:	54,528	
<hr/>		

```
Epoch 1/25
225/225 [=====] - 169s 717ms/step - loss: 1.2297 - categorical_accuracy: 0.5352 - precision: 0.7434 - recall: 0.3401 - ...
Epoch 2/25
225/225 [=====] - 36s 159ms/step - loss: 0.9304 - categorical_accuracy: 0.6574 - precision: 0.7682 - recall: 0.5308 - ...
Epoch 3/25
225/225 [=====] - 34s 151ms/step - loss: 0.7411 - categorical_accuracy: 0.7304 - precision: 0.8065 - recall: 0.6476 - ...
Epoch 4/25
225/225 [=====] - 67s 297ms/step - loss: 0.5743 - categorical_accuracy: 0.7944 - precision: 0.8439 - recall: 0.7408 - ...
Epoch 5/25
225/225 [=====] - 43s 192ms/step - loss: 0.4181 - categorical_accuracy: 0.8535 - precision: 0.8819 - recall: 0.8239 - ...
Epoch 6/25
225/225 [=====] - 43s 192ms/step - loss: 0.2992 - categorical_accuracy: 0.8947 - precision: 0.9127 - recall: 0.8791 - ...
Epoch 7/25
225/225 [=====] - 43s 192ms/step - loss: 0.2197 - categorical_accuracy: 0.9238 - precision: 0.9334 - recall: 0.9151 - ...
Epoch 8/25
225/225 [=====] - 38s 168ms/step - loss: 0.1787 - categorical_accuracy: 0.9401 - precision: 0.9465 - recall: 0.9340 - ...
Epoch 9/25
225/225 [=====] - 43s 190ms/step - loss: 0.1303 - categorical_accuracy: 0.9572 - precision: 0.9611 - recall: 0.9537 - ...
Epoch 10/25
225/225 [=====] - 43s 190ms/step - loss: 0.1231 - categorical_accuracy: 0.9577 - precision: 0.9617 - recall: 0.9544 - ...
Epoch 11/25
225/225 [=====] - 43s 191ms/step - loss: 0.1113 - categorical_accuracy: 0.9629 - precision: 0.9655 - recall: 0.9599 - ...
Epoch 12/25
225/225 [=====] - 43s 192ms/step - loss: 0.0960 - categorical_accuracy: 0.9680 - precision: 0.9705 - recall: 0.9659 - ...
Epoch 13/25
...
Epoch 24/25
```

Evidence of Completion

Dataset & Model Training Results

- Primary dataset
 - FER– 2013 (Learn facial expressions from an image) on Kaggle



Training and validation loss over epochs

Evidence of Completion

API Request and Face Detected Mongo DB results



POST <http://127.0.0.1:5000/api/v1/emotion/detection>

Params Authorization Headers (10) **Body** Scripts Settings

none form-data x-www-form-urlencoded raw binary GraphQL

Key	Value
<input checked="" type="checkbox"/> file	File im991.png
Key	Value

Body Cookies Headers (5) Test Results

Pretty Raw Preview Visualize JSON

```
1 {  
2   "prediction": "neutral"  
3 }
```

clusteru.pvrua.mongodb.net / EmotionDataDB / history

Documents 359 Aggregations Schema Indexes 1 Validation

Type a query: { field: 'value' } or [Generate query](#).

+ ADD DATA EXPORT DATA UPDATE DELETE

100 1 - 100 of 359

_id	StudentId	ActivityId	TimeStamp	Emotion
_id: ObjectId('6730f29ae020f03fc5643a78')	8	7	"2024-11-10 23:21:22"	"neutral"
_id: ObjectId('6730f2cee020f03fc5643a7a')	9	2	"2024-11-10 23:22:14"	"happy"
_id: ObjectId('6730f2cfe020f03fc5643a7b')	4	5	"2024-11-10 23:22:15"	"neutral"
_id: ObjectId('6730f2cfe020f03fc5643a7c')	7	8	"2024-11-10 23:22:15"	

What to Continue On...

Future Work



1. Calculate and Determine Emotion Class (10% left)
2. Provide Personalized Feedback For Guardian with more user friendly way
3. Create API for Difficulty Adjustment according the emotional state



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TOUCH MATH APPROACH FOR ENHANCING NUMBER SENSE AND MATHEMATICAL OPERATIONS

Background

For Dyscalculic adolescents,

- Hard to identify numbers.
- Memorable and auditory learning is precious.



Research Problem



- Lack Analytical Skills
- Insufficiency of Traditional Methods
- Need Alternative Approaches
- Need more personalized study process

Objectives

NOVELTY OBJECTIVE

- Implement teaching numbers with text-to-speech feature.
- Integrate voice recognition to analyze number pronunciation

OTHER SUB OBJECTIVES

- Providing practice sessions, utilizing touch mach approach
- Providing mathematical operations utilizing touch mach approach
- Generate performance report



Requirements

System Requirements

- ❖ User-friendly and accessible design.
- ❖ Enable touch points
- ❖ A microphone

Personal Requirements

- ❖ Concern to use touch points
- ❖ Concern about capturing speech audio data
- ❖ Clear voice volume

Software Requirements

- ❖ Web browser with microphone access

Functional Requirements

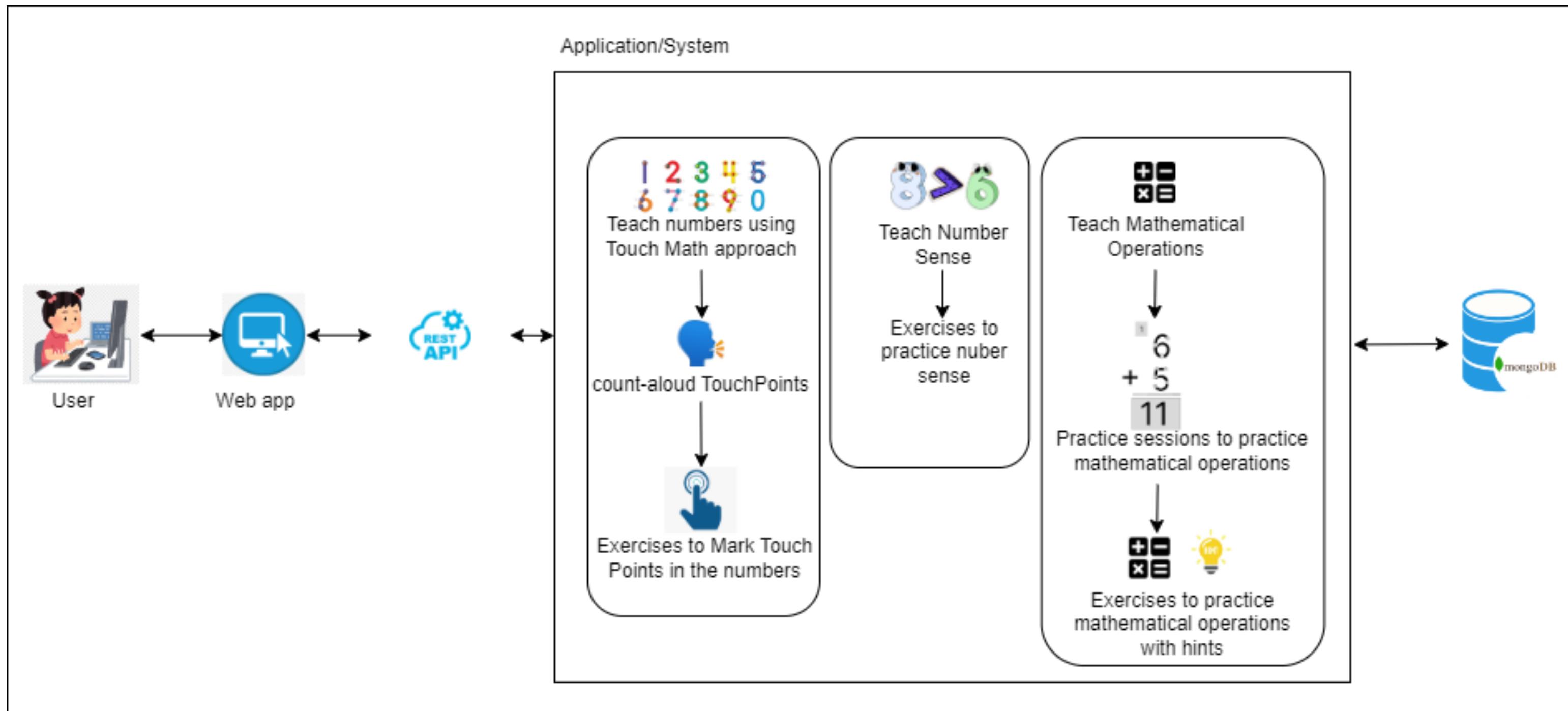
- ❖ Create an account and login to the system
- ❖ Perform test to identify most difficult areas
- ❖ Perform learning and practice session

Non-Functional Requirements

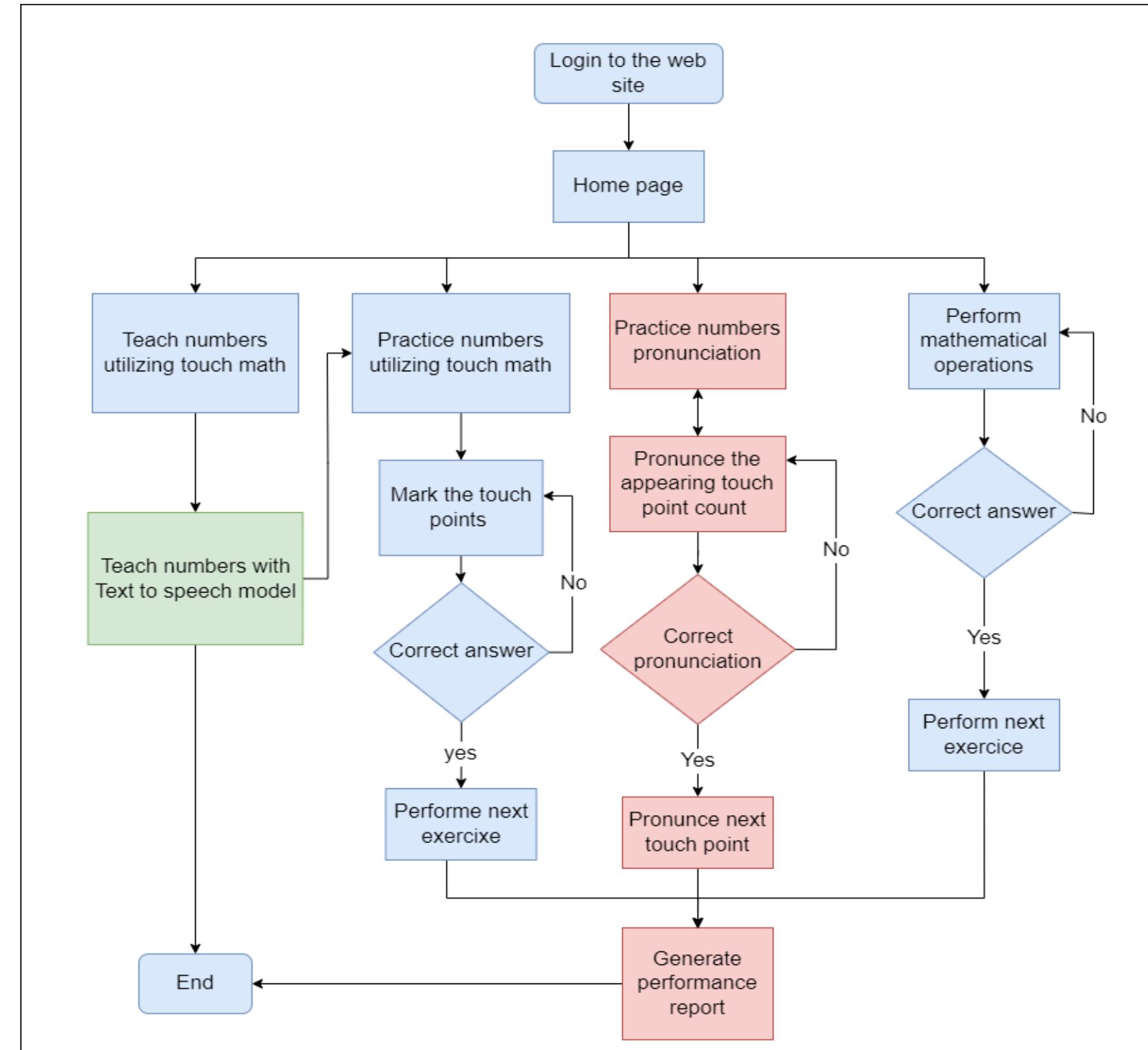
- ❖ Reliability
- ❖ Accuracy
- ❖ Security



Methodology



Flow Chart



Current Progress

Overall completion - 60%



Completions of the component

1. Teaching and Practicing Numbers

- ❖ Rendering interactive touch points for numbers – 100%
- ❖ Allowing users to practice touch point interactions for number learning – 100%

2. Text-to-Speech Integration

- ❖ Implementing using Web Speech API - 80%

3. Practicing Mathematical Operations

- ❖ Rendering interactive touch points for operations – 100%
- ❖ Generating random numbers – 100%

Evidence of Completion

Teaching process

Let's Learn Number 6

Let's Learn Next

Addition Operations

Touch Math Addition Practice

$$4 + 6 = \boxed{}$$

Submit Answer



Practice Sessions

Mark the touchpoints for number 5

Check Answer Next

Subtraction Operations

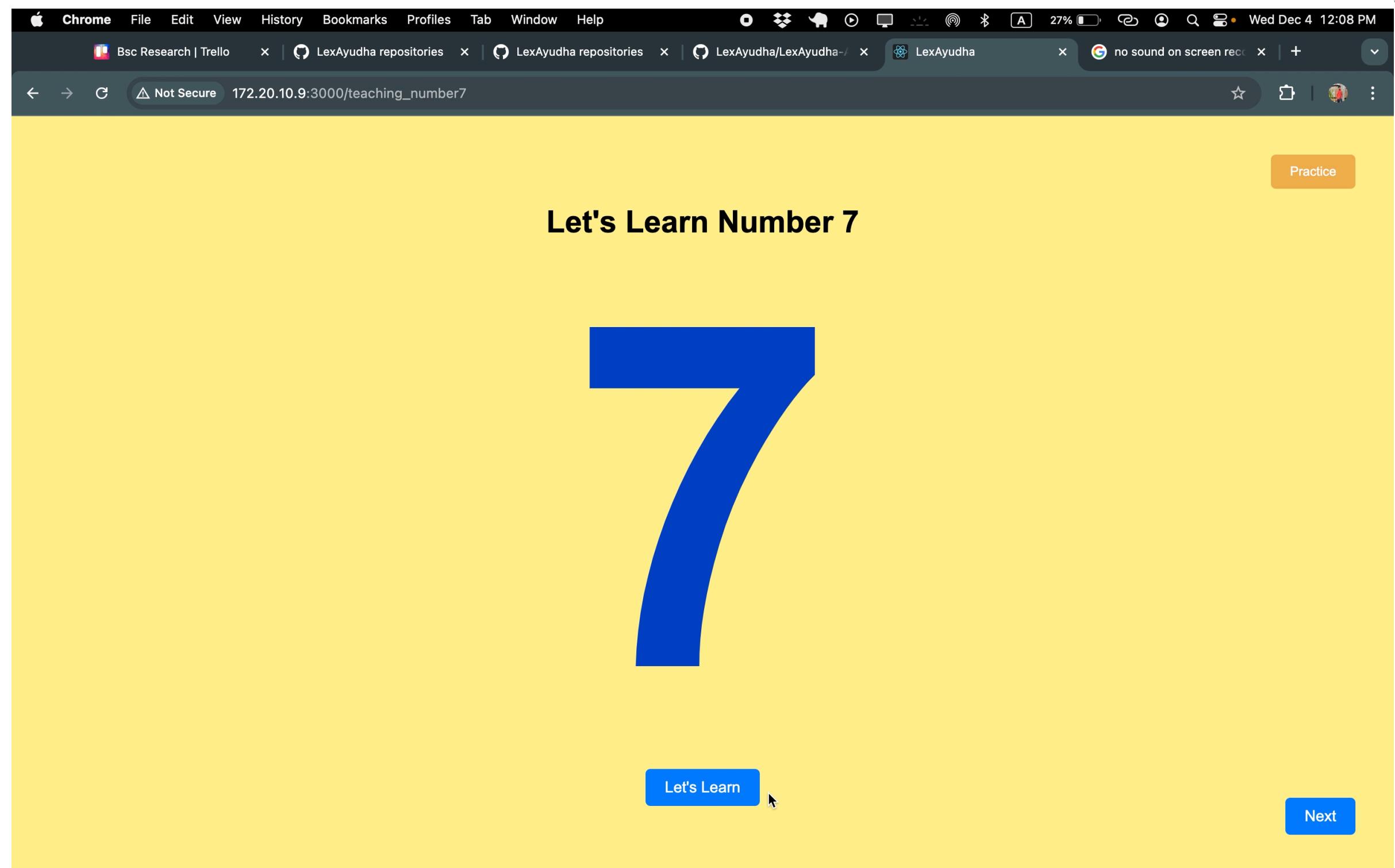
Touch Math Subtraction Practice

$$6 - 3 = \boxed{}$$

Submit Answer

Evidence of Completion

Teaching process



Risk Mitigation

Identified Risks & Mitigation Strategies



Unexpected behavior in the Text-to-Speech (TTS) Feature

Mitigation can be done by testing it further and finding the root cause and address that issue.

Data Privacy and Security

Mitigated by limiting data collection to only what is necessary

What to Continue On...

Future Work



1. Fix pronunciation delay .
1. Speech pronunciation detection.
2. Performance report generation.



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ENHANCING READABILITY AND SPEAKING SKILLS IN DYSLEXIC ADOLESCENTS THROUGH PERSONALIZED SPEECH PACE

Overview

Speech Pace and Dyslexia – Why does it matter?

Research Gap

Limits in personalized speech pace in existing methods

Research Problem

How can we leverage the latest technology trends
How can we exceed and overcome current limitations

Solution with novelty

Speech Pace Detection using Deep Learning.



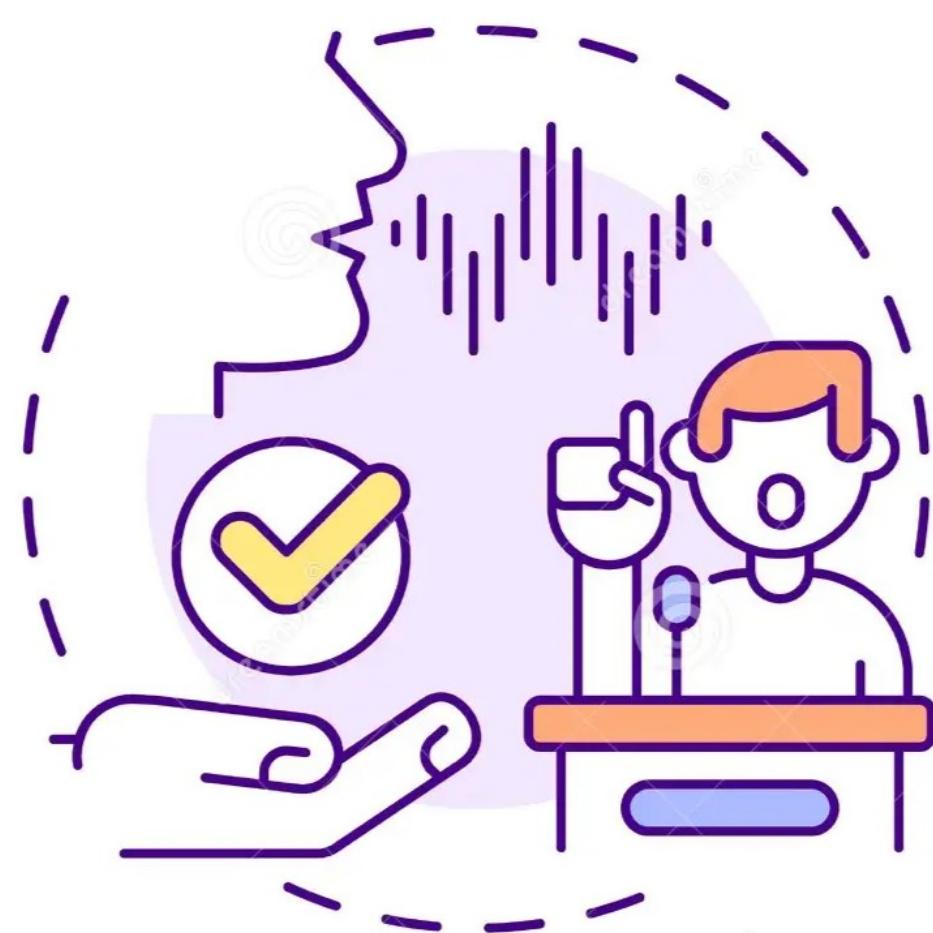
Objectives

SPECIFIC OBJECTIVE

Develop AI speech pace system for personalized learning

SUB OBJECTIVES

- Detect speech pace through voice data.
- Analyzing voice features.
- Integrating detected speech pace with text to speech(TTS) model
- System evaluation and validation.



Requirements

System Requirements

- ❖ Stable internet connection.
- ❖ A microphone.

Personal Requirements

- ❖ Consent to capture speech audio data.
- ❖ Clear & sufficient speech volume.

Software Requirements

- ❖ Web browser with microphone access.

Functional Requirements

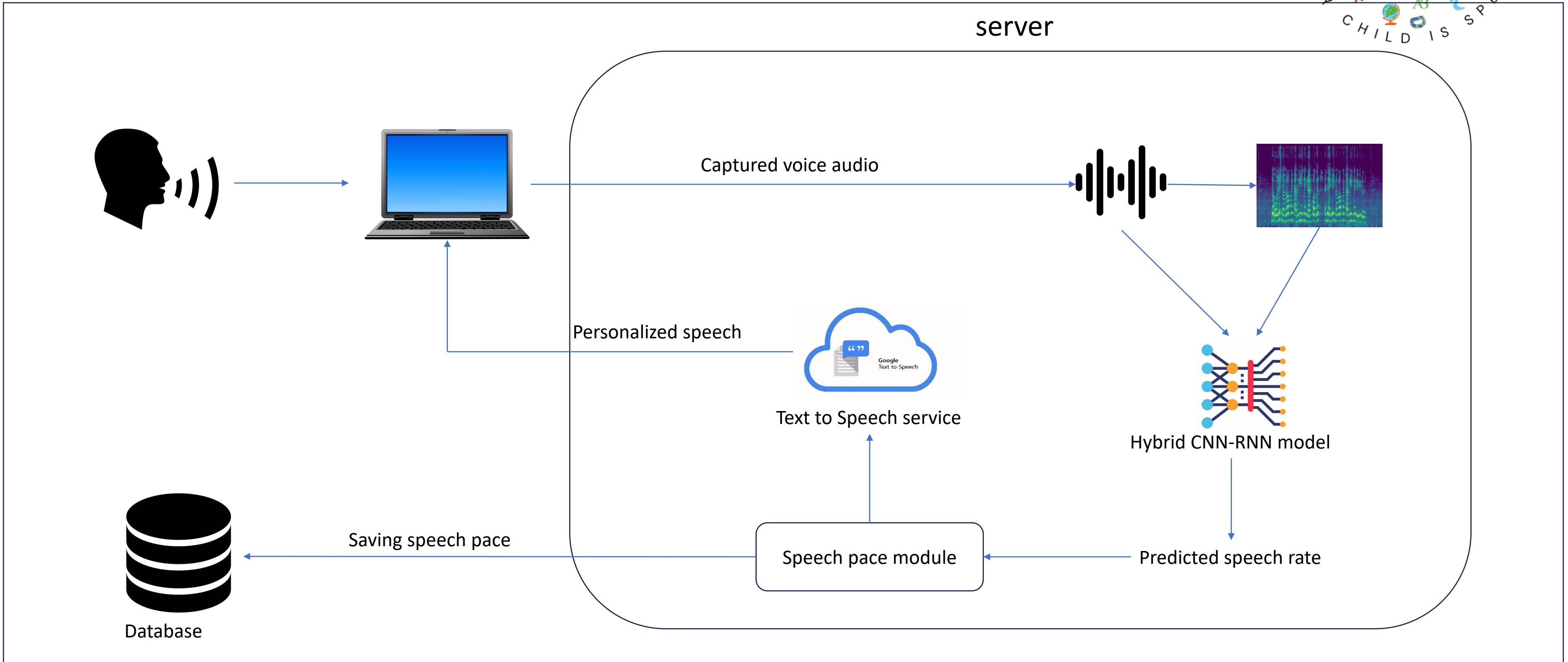
- ❖ Automated speech pace detection.
- ❖ Customized speech pace for each individual.

Non-functional Requirements

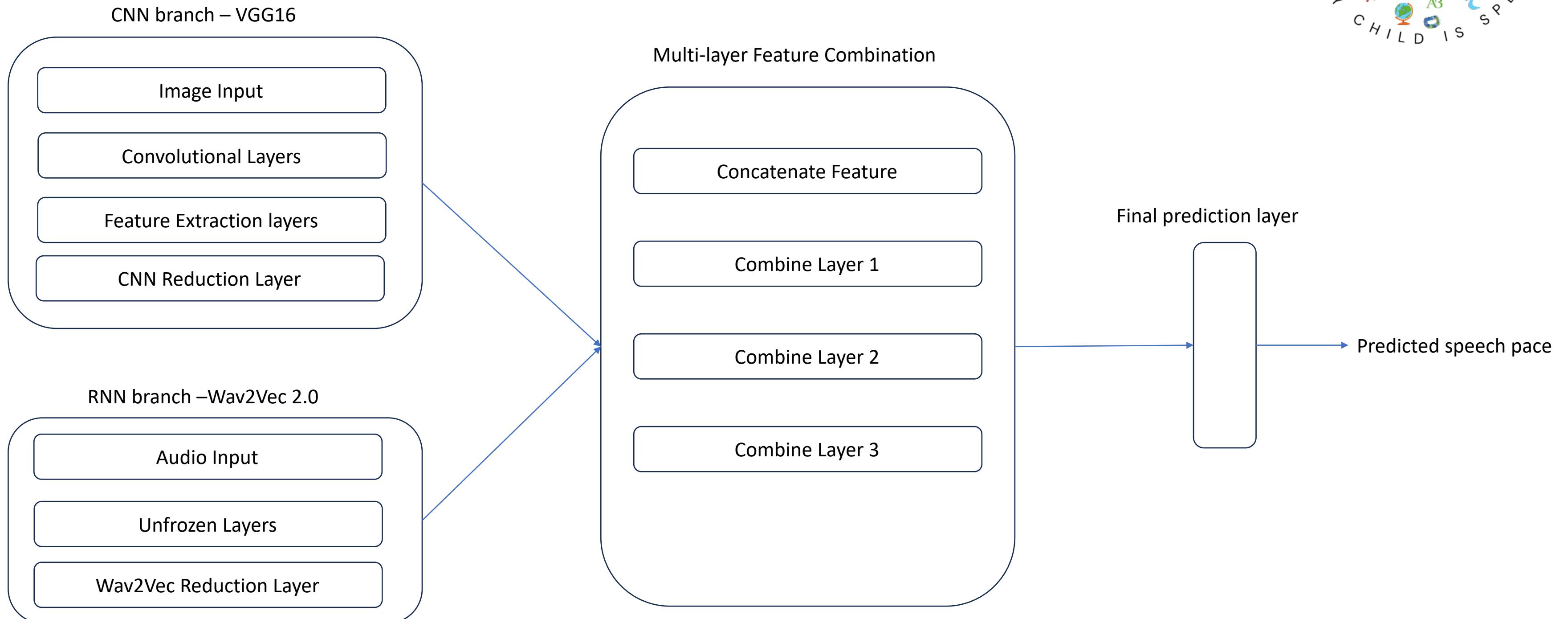
- ❖ Speech pace accuracy.
- ❖ Reliability & availability .



Methodology



Model Architecture



Current progress

Overall completion - 60%

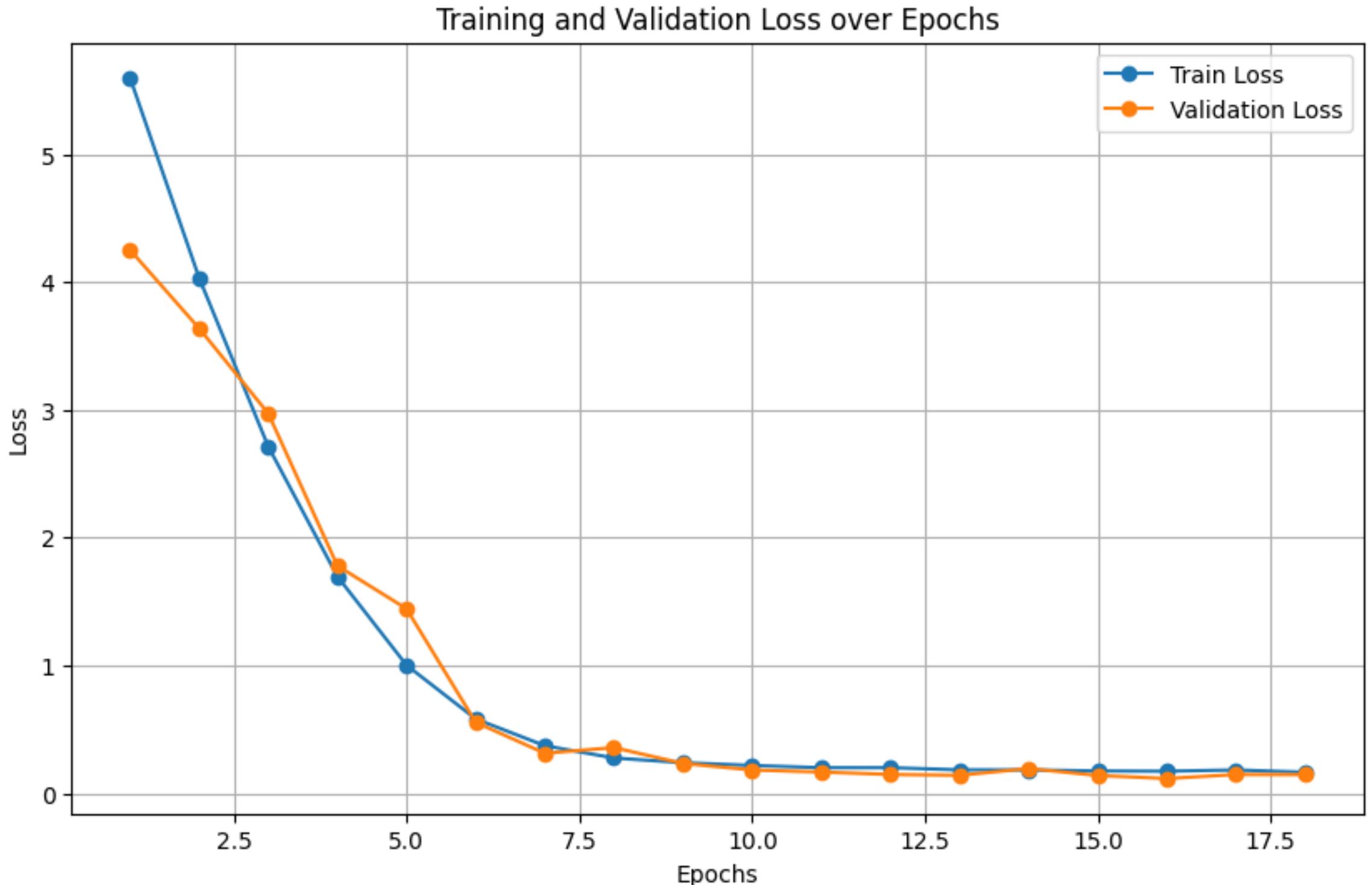


Completion of objectives

1. Detect speech pace.
 - ❖ Hybrid model implementation - 100%.
2. Analyzing voice features.
 - ❖ Hybrid model training - 75%.
3. Integrating detected speech pace with text to speech(TTS) service.
 - ❖ Hybrid model integration - 100%.
 - ❖ TTS service integration - to be done.
4. System evaluation and validation.
 - ❖ To be done.

Evidence of Completion

Model Training Results



- Dataset
 - **Non-Native Children English Speech (NNCES)**
 - **Corpus on Kaggle**

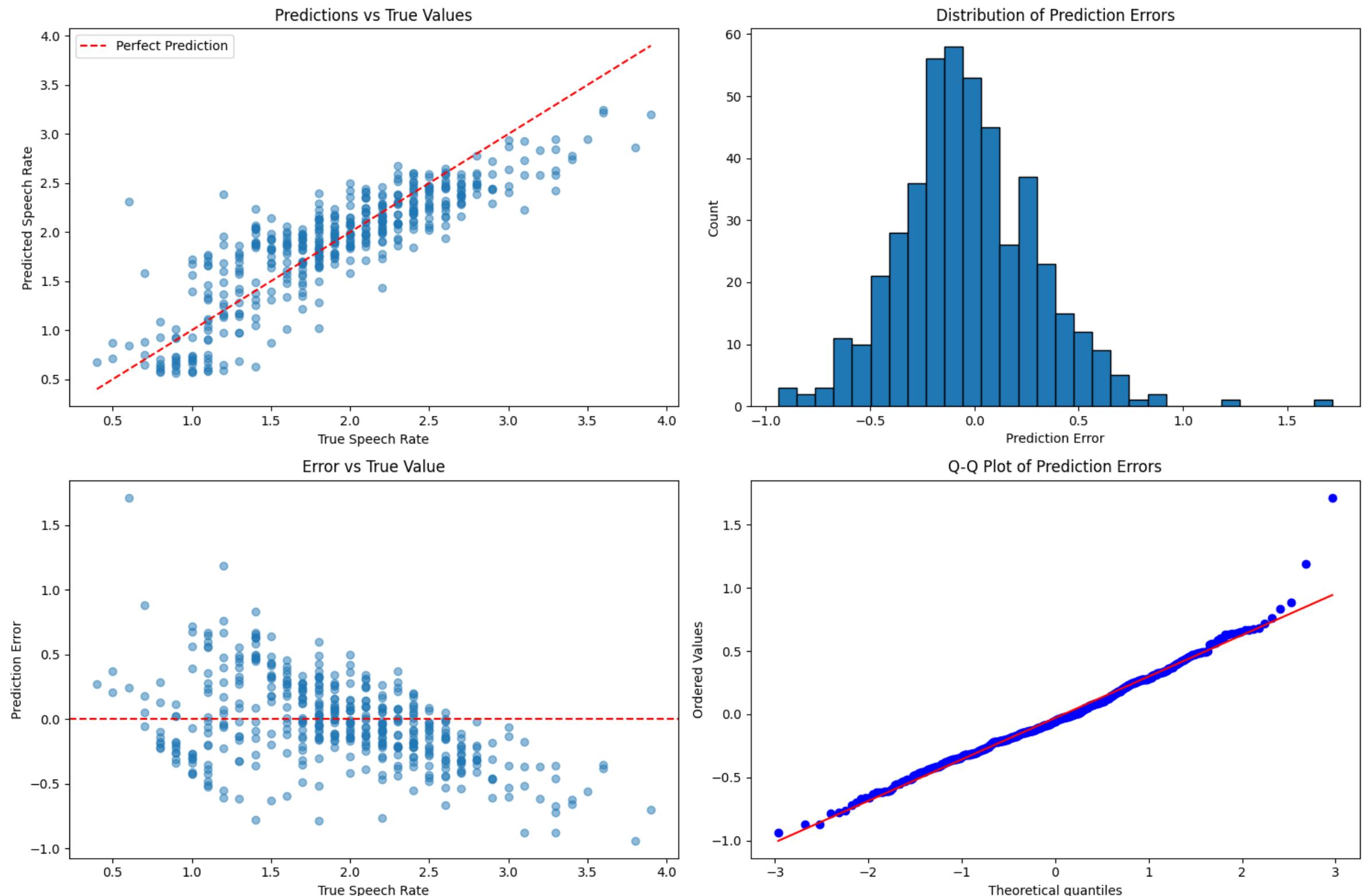


Visit Dataset



Evidence of Completion

Model Performance Metrics



Evidence of Completion

Model Integration Testing - API Testing



POST | <http://127.0.0.1:5000/api/v1/predict/speech>

Params Authorization Headers (10) Body • Scripts Settings

Body Cookies Headers (5) Test Results

Pretty Raw Preview Visualize JSON ↻

```
1 {  
2   "prediction": 1.8048804998397827  
3 }
```

Risk Mitigation

Identified Risks & Mitigation Strategies



Poor model training caused by unbalanced data.

Mitigated by mixing gathered training data with Kaggle dataset.

Model Overfitting

Mitigated by adding regularization methods.

Data Storage & Privacy Concerns

Mitigated by immediately deleting data after the prediction is completed.

What to Continue On...

Future Work



1. Implementation of speech pace module.
2. Text to Speech service integration.
3. System validation and evaluation.



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Teaching based on Chromatic Variations For Dyslexics to improve Reading Skills

Overview

Dyslexia – Most common Learning Disability

Reading – Most common symptom



Existing Solutions

Nessy – User friendly mobile app

ClarroSpeak – Text highlighting enabled app

Research Gap

Why not a scientifically proven method?

Is all the same?

Solution with novelty

LexaAyudha

Chromatic Variation, Personalization, Web Application



Overview

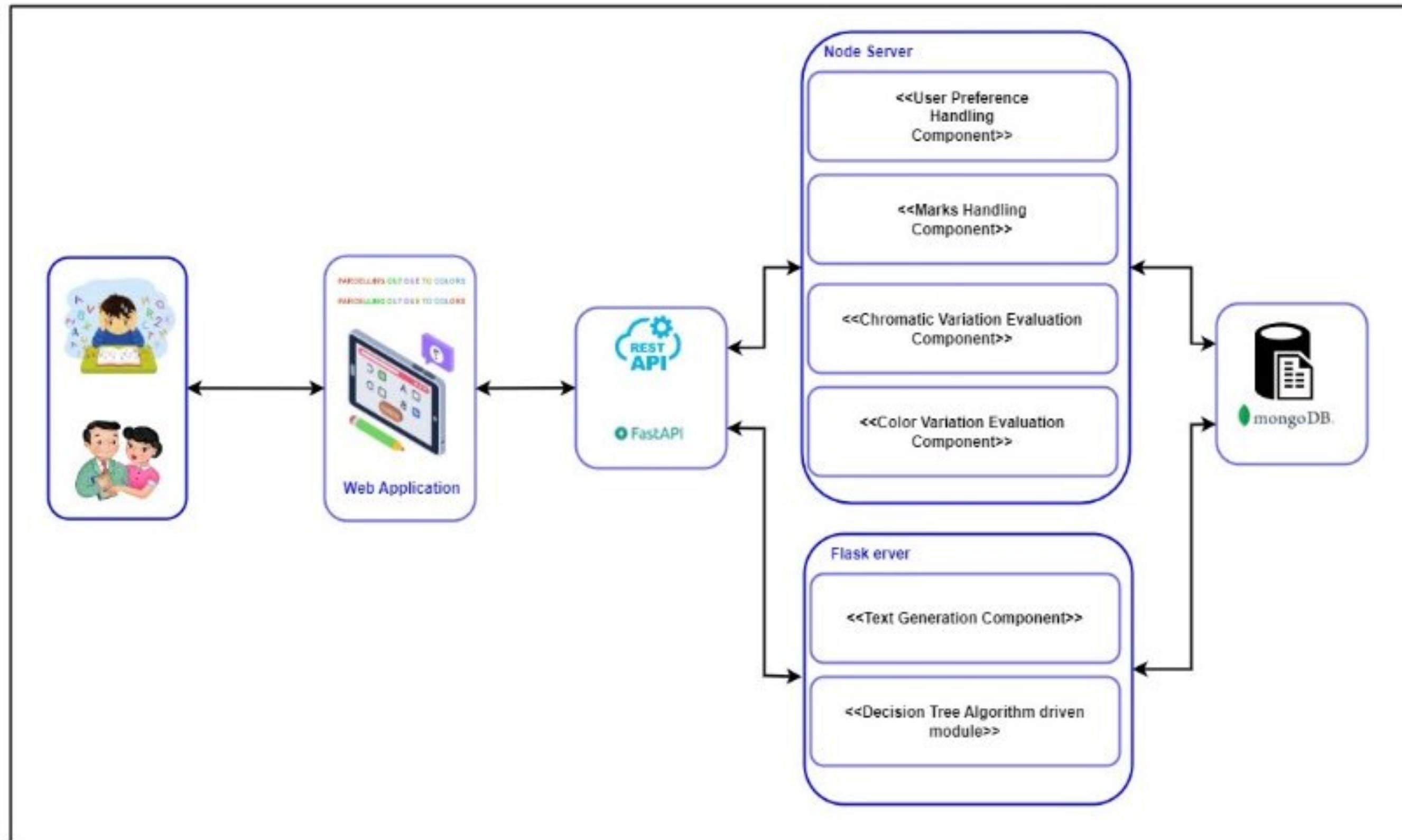
Research Problem

- ❖ Automating the generation of meaningful sentences with personalization capabilities.
- ❖ Identifying suitable chromatic variation type complexity level.

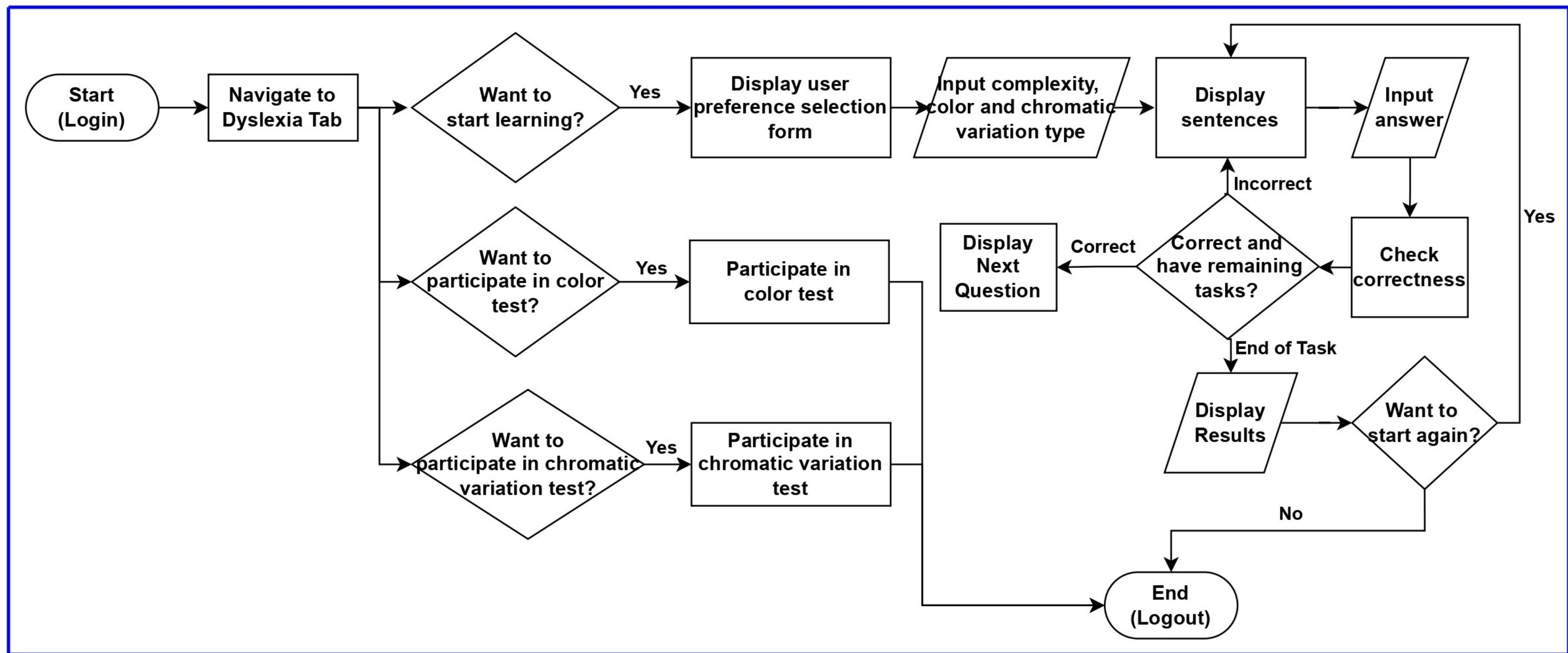
Objectives

- ❖ Identify the appropriate chromatic variation types and colors.
 - Sample test to identify the efficient color combinations.
 - Sample test to identify the most efficient chromatic variation type.
- ❖ Provide a personalized activity plan.
 - Test to check the reading skills to customize the complexity levels of the tasks.
 - Create personalized reading task plans.

Methodology

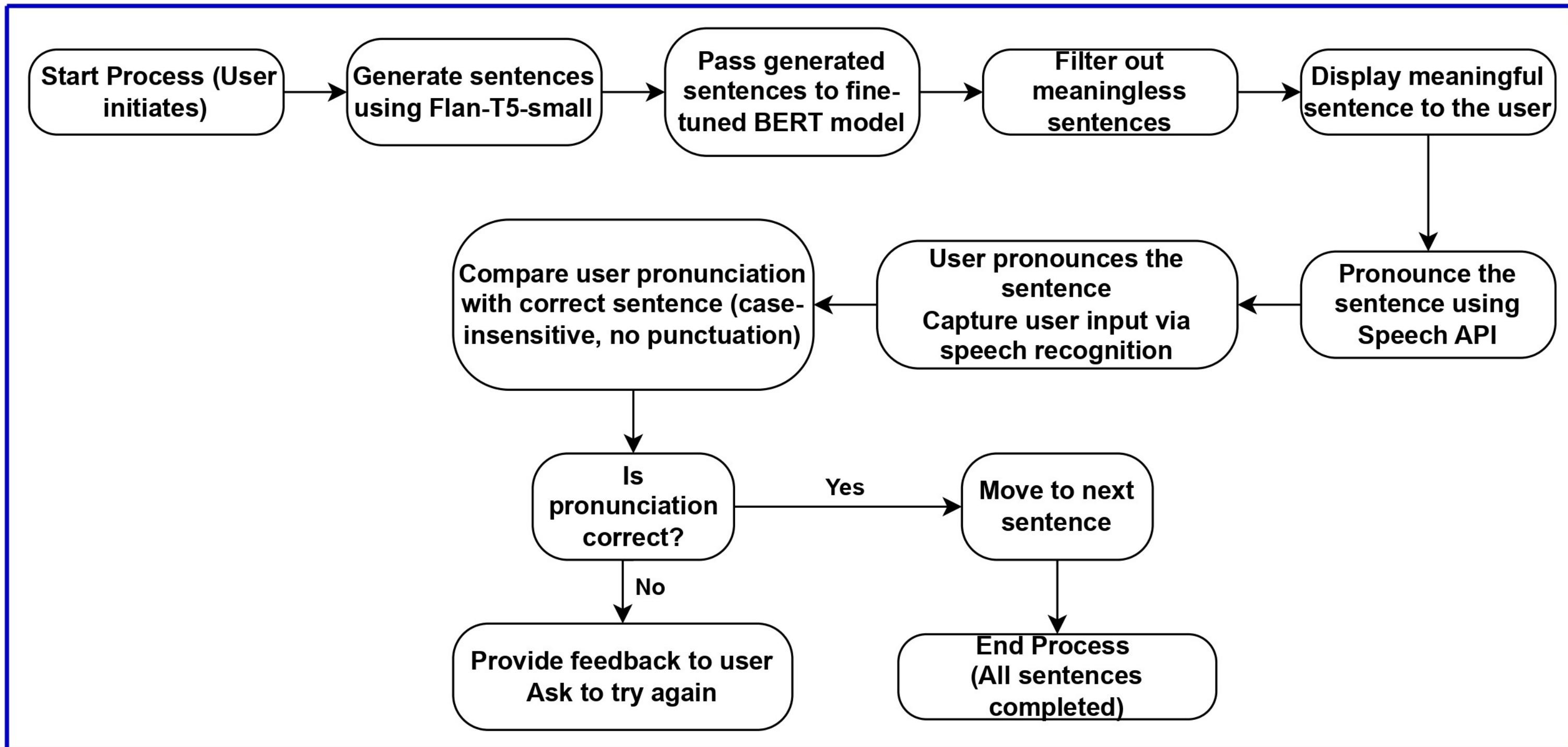


System Flow



Progress

Overall completion - 56%



Requirements

Functional Requirements

- ❖ Create a personal account and access the application
- ❖ Perform suited chromatic variation and color variation tests
- ❖ View and learn personalized lessons
- ❖ Perform quizzes and assess the performance

Non-Functional Requirements

- ❖ Reliability
- ❖ Accuracy
- ❖ Security

System Requirements

- ❖ Stable internet connection.
- ❖ A microphone.

Personal Requirements

- ❖ Consent to provide speech audio data.

Software Requirements

- ❖ Web browser with microphone access.



User Requirements and Evidence of Completion



- ❖ **View and learn personalized lessons**
 - Generate sentences with specified complexity
 - Check for meaning
 - Display only meaningful sentences

- ❖ **Perform quizzes and assess the performance**
 - Present the sentences as a questionnaire
 - Pronounce the words
 - Check for accuracy

- ❖ **Perform chromatic variation test**

- ❖ **Perform color test**

A screenshot of the Postman application interface. The URL is "http://127.0.0.1:5000/generate_and_classify_sentences" and the method is "POST". The "Body" tab is selected, showing the following JSON input:

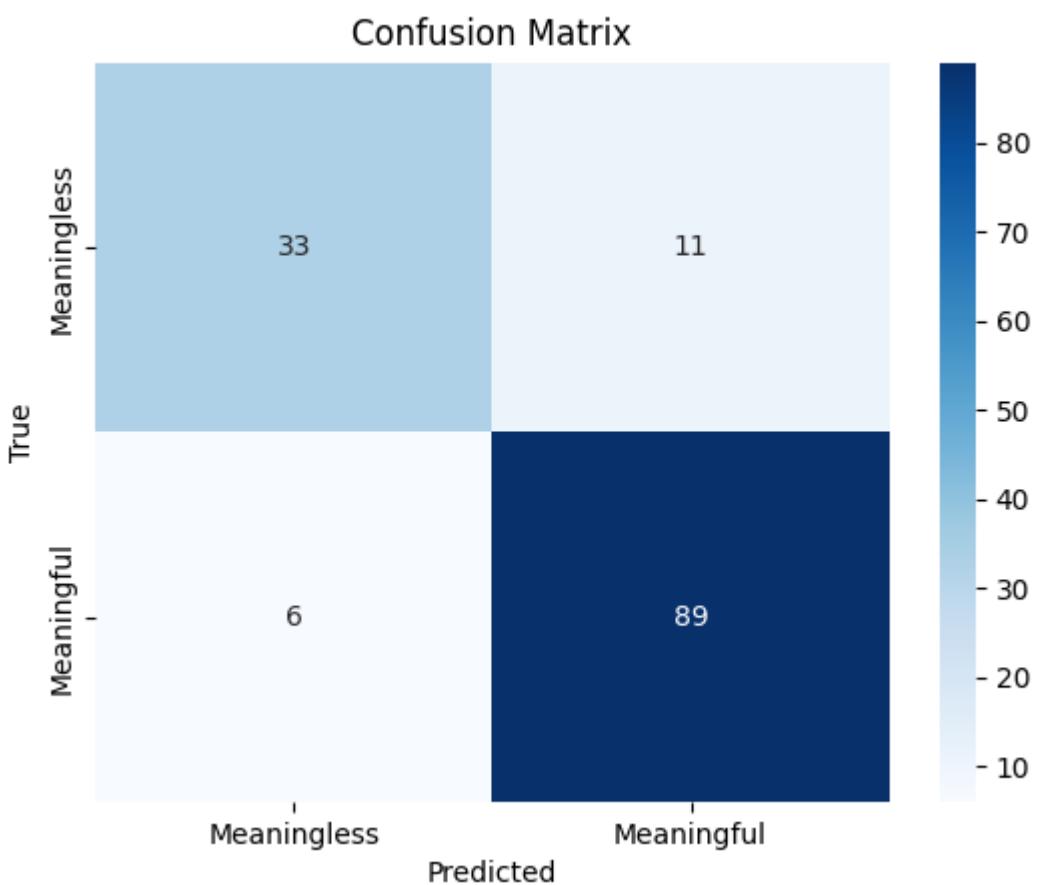
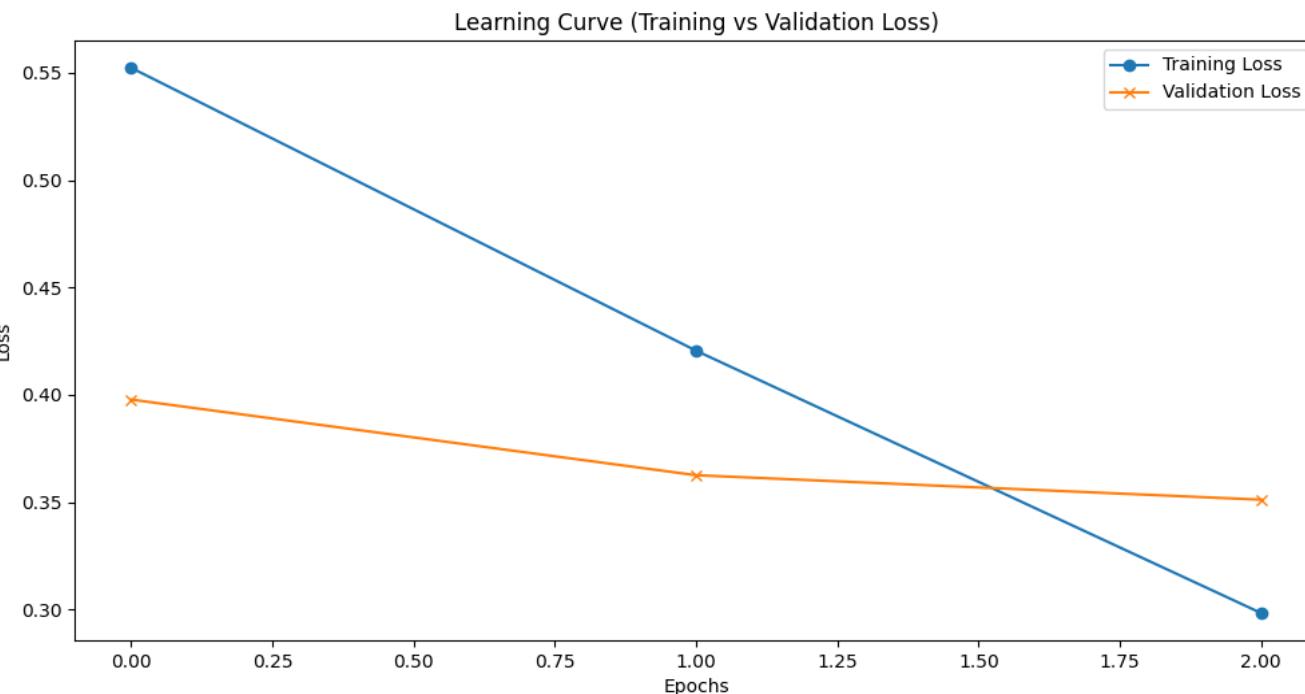
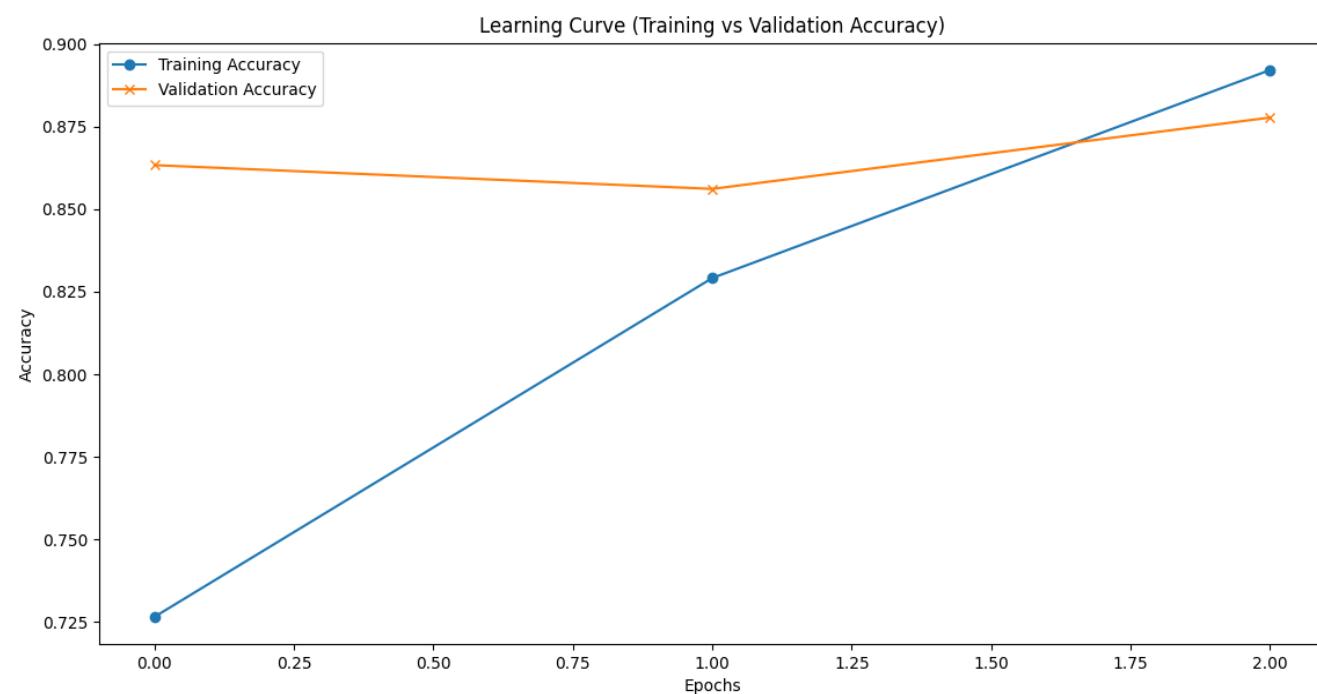
```
1 {  
2   "target_word_count": 5,  
3   "num_sentences": 10  
4 }
```

The response status is "200 OK" with a time of "9.63 s" and a size of "493 B". The "Pretty" tab shows the JSON output:

```
1 {  
2   "meaningful_sentences": [  
3     "The man is a boy.",  
4     "There are 10 different children.",  
5     "Two boys are playing tennis.",  
6     "The boy is a student.",  
7     "There are two different children.",  
8     "The kids ate 10 cookies.",  
9     "One boy is a baby.",  
10    "The boy is very clever."  
11  ]  
12 }
```

Highlighted tasks are planned to completed before Project Presentation 2

Evidence of Completion



Evidence of Completion



HTTP LexaAyudha / Sentence Generation

POST http://127.0.0.1:5000/generate_sentences

Params Authorization Headers (9) Body Scripts Settings Cookies Beautify

Body none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {
2     "target_word_count": 5,
3     "num_sentences": 10
4 }
```

Body Cookies Headers (6) Test Results 200 OK 8.53 s 516 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2     "sentences": [
3         "The teacher was very clever.",
4         "The boy is a hamster.",
5         "The child is a student.",
6         "The boy is very excited.",
7         "The poodle is a child.",
8         "A dog eats a tree.",
9         "The boy is a teacher.",
10        "The mother is a doctor.",
11        "The dog is a pig.",
12        "The boy is a dog."
13    ]
14 }
```

POST Sentence Generation POST Sentence Classification +

HTTP LexaAyudha / Sentence Classification

POST http://127.0.0.1:5000/classify_sentences

Params Authorization Headers (9) Body Scripts Settings Cookies Beautify

Body none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
7 "The poodle is a child.",
8 "A dog eats a tree.",
9 "The boy is a teacher.",
10 "The mother is a doctor.",
11 "The dog is a pig.",
```

Body Cookies Headers (6) Test Results 200 OK 6.39 s 361 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2     "meaningful_sentences": [
3         "The teacher was very clever.",
4         "The boy is very excited.",
5         "The boy is a teacher.",
6         "The mother is a doctor."
7     ]
8 }
```

HTTP LexaAyudha / Generate and Classify Sentences

POST http://127.0.0.1:5000/generate_and_classify_sentences

Params Authorization Headers (9) Body Scripts Settings Cookies Beautify

Body none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {
2     "target_word_count": 5,
3     "num_sentences": 10
4 }
```

Body Cookies Headers (6) Test Results 200 OK 14.05 s 367 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2     "meaningful_sentences": [
3         "The children are all happy.",
4         "The children ate the vegetables.",
5         "I am writing a book.",
6         "The kid is very clever."
7     ]
8 }
```

Evidence of Completion



Sentence Generator and Classifier

Prompt:

Target Word Count:

Number of Sentences:

Generated Sentences:

- The child is eating pizza.
- There are six different dogs.
- The boy is a rocker.
- They were in a hive.
- The children are all adults.
- There are two different children.
- The child is not healthy.
- There are 10 different colors.
- The children are a boy.
- The child is a student.

Meaningful Sentences:

The child is eating pizza.

React App × +
localhost:3000

Sentence Generator and Classifier

Prompt:

Target Word Count:

Number of Sentences:

Generated Sentences:

- The kids are playing together.
- The child is a student.
- The child is a student.
- I learned how to read.
- The child is a boy.
- A child is a child.
- The narrator was a student.
- The teacher was a teacher.
- The boys are very intelligent.
- The teacher is a teacher.

Meaningful Sentences:

The kids are playing together.



Risk Mitigation

Identified Risks & Mitigation Strategies



Model performance Issues

Regular tests

Fine tuning the model periodically

Keep a default set of appropriate sentences.

Insufficient meaningful sentences in the dataset

Increase the dataset with additional labeled data.

Unauthorized access to the system could lead to misuse

Implement authentication and authorization mechanisms to secure endpoints

Interface may not be user-friendly or accessible

Conduct usability testing with diverse users and incorporate feedback

Future Direction



Task Name	Progress	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Project Initiation																	
Study about research gaps	100%																
Deciding appropriate research area	100%																
Going through research papers	100%																
Finding a topic	100%																
Requirements Gathering & Analysis																	
Identifying functional requirements	100%																
Identifying non-functional requirements	100%																
Identifying data requirements	100%																
Identifying knowledge requirements	100%																
Design																	
Creating the figma prototype	100%																
Development																	
Model training	75%																
Backend Development	75%																
Frontend Development	55%																
Testing																	
Unit and API testing	75%																
Integration Testing	45%																
Load Testing	0%																
User Acceptance Testing	0%																
Deployment	0%																

1. Fine tuning the model
2. Chromatic variation test
3. Color Test



COMMERCIALIZATION ASPECT

Monetizing Aspect



- Subscription based business model
- Donation enabled

Silver	Gold	Platinum
Free Per Month	\$2 Per Month	\$3 Per Month
<ul style="list-style-type: none">● for individual use● trial AI features	<ul style="list-style-type: none">● for parents● add up to 3 user accounts● enabled personalization	<ul style="list-style-type: none">● for teachers● add up to 15 user accounts● advanced personalization

Marketing Aspect



Primary Target Audience: The parents of learning divergent adolescents

Secondary Target Audience: Educators, Special education professionals

- Digital Marketing
 - Social media marketing
 - Blogs
 - Email marketing
- Partnerships
 - Collaboration with schools
 - Collaboration with dyslexic educational institutes



Budget



Description	Cost
Vercel – Frontend Deployment	Free Tier
Render – Backend Deployment	Free Tier
Azure Cosmos DB	Free Tier(25GB Lifetime)
Azure Blob Storage	
Mongo DB (Development)	\$0.018 per GB (First 5GB Free)
Google speech to Text	1 hour free for month \$0.006 per 15 seconds over 60 mins up to 1 million mins
Azure App Services – Application Deployment	Free Tier
Google Colab Pro	\$9.99



THANK YOU

AI-based Personalized Rehabilitation for Dyslexia and Dyscalculia Adolescents



ANY QUESTIONS?

