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Personalised Learning App for Special Children

Ishita[1], Anshika[2], Tarak[3], Hemlata[4]
Research Scholar, Department of Computer Science & Engineering (AI & DS), Panipat Institute of Engineering and Technology, Panipat, India [1,2,3,4]

Ishita4777@gmail.com[1], anshika2233@gmail.com[2], tarak10@gmail.com[3]

Abstract. *Special children, for example, if they suffer from any of the disease or any of the mental disability that is mainly a CP murmur. Or IP children's that are able to write but have some problem with the. Synchronization of the brain and the other motor organs like hands or legs. So writing is one of their therapy that is being used in the schools to give them a specific training for these motor skills only so the teachers cannot focus. On every child as much as possible because they give a common homework to everyone present in the class. So this app is going to make everything personalized. Basically what it does for each and every student there would be a separate learning strategy. There would be separate learning platform or there would be a separate analysis of what they are doing and how their motor skills are being improving or whether they are lagging behind in some of the participation of teacher. Teachers here can also interact with the AI feature so that they can. As the AI according to the. The students data that is present in the database that we have built.*

Keywords: Learning, Children, Softmax.

Introduction

What the problem is basically special children's with ability like Marc Gpib suffer from Lack of synchronization With their brain and other motor organs. So writing is one of the therapy that has been given to these children so that the synchronization between the brain and motor organs improve they are not like. Simple child. They are special because they don't write something to learn, but they write something to improve their motor skills. Why this thing matters? Because there would be a personalized attention in the class as teacher gives the homework to the whole class without even looking at whether the child actually suffering from that problem or not. They just give one for homework to each and everyone present in the class. So there is current limitation that a teacher lags behind that each and every child would not be able to get that attention from the teacher and sometimes they lag behind their therapy or the motor skills improvement. So what our proposed system does, basically it improves the child's confidence by giving them personalized attention via the teachers. Each and every child would be analyzed personally and after the personalizations they would be analyzed accordingly and. There would be a specific improvements on the letters that they are performing and there would be other motor skills observations that could help the child to improve in future.

How it works? Basically in the UI there would be an upload image option where in that the teacher uploads the image of. The writing of the student and after the image updation there would be like a whole writing analysis that is being done by the ML model that we have prepared in the back end. After that each and every word would be given a score like how that a score matters. For example, if a child is making mistakes in letter B again and again, or for example it is skipping the stroke in P letter. So that means the child is very. Ohh, active and extremely active basically. So that clearly tells that they are suffering from any ADHD side effects or anything like that. So that is the feedback that is given from. On this app. And after that there would be motor skills, observations and other teaching strategies that are being provided for personalized to the teacher according to that student only because we are saving the data of student into our database. Technologies: Technologies involved in our first proposed solution is that we are using CNN model first. What it does is it breaks down the image into. 28X by 28 pixels. After that, the image is being sent to the model like each and every pixel is being treated as an input to each and every input neuron. So after that the weights have been applied and the final output is generated like how each and every it detects each and every letter and the final layer of CNN is for that is using softmax function basically. To detect the percentage of whether the child has correctly returned the structure of the word or not. After that, the image that is being detected by the our model is being sent to the large language model to check whether the expected output from the. Model that we have built is good enough or not and it just validates it and corrects it if it is not correct and after that it is shown to the UI or to the user.

2. Literature review

So there are some systems that already exist in the market, but they are not for special children, but they are for normal children. So also in the actually how the things work in real world, the. Teacher is present in the class of 40 to 50 students and the teacher is not able to analyze each and every student personally. So they give whole homework to each to everyone in the class instead of giving instead of looking at each and every child personally as it is not possible for. Single teacher. So there are some OCR based systems or there are some? Present in the market but they are not solving the problem for special solution. They are based on the normal child writing strategies. So there are there are our improvements like how we are improving the existing solutions. We are keeping it AI based. And we are trying to give the personalized solution to each and every child present in the class. Basically it is a CNN LLM based approach. Key functionality :Here what we do, we basically predict each and every word and after that letter scoring is being done to detect whether the letter is refined, written correctly or not. After that the error detection is being happens where the Gemini basically generates what the child is making mistakes or what improvements must be there. After that the recommendation is given. Like how the teacher can make the learning of the child personalize and improve in the goals. Goal: Here our goal is to provide personalized teaching strategies and to improve the child's performance. Personalized because as a teacher gives homework to the whole class and each and every child is not given that much attention that is needed. So we are making this solution to provide each and every. That attention that they need and to improve their confidence and so that they can do something in their life. Technologies: Technologies involved in our first proposed solution is that we are using CNN model first. What it does is it breaks down the image into. 28X by 28 pixels. After that, the image is being sent to the model like each and every pixel is being treated as an input to each and every input neuron. So after that the weights have been applied and the final output is

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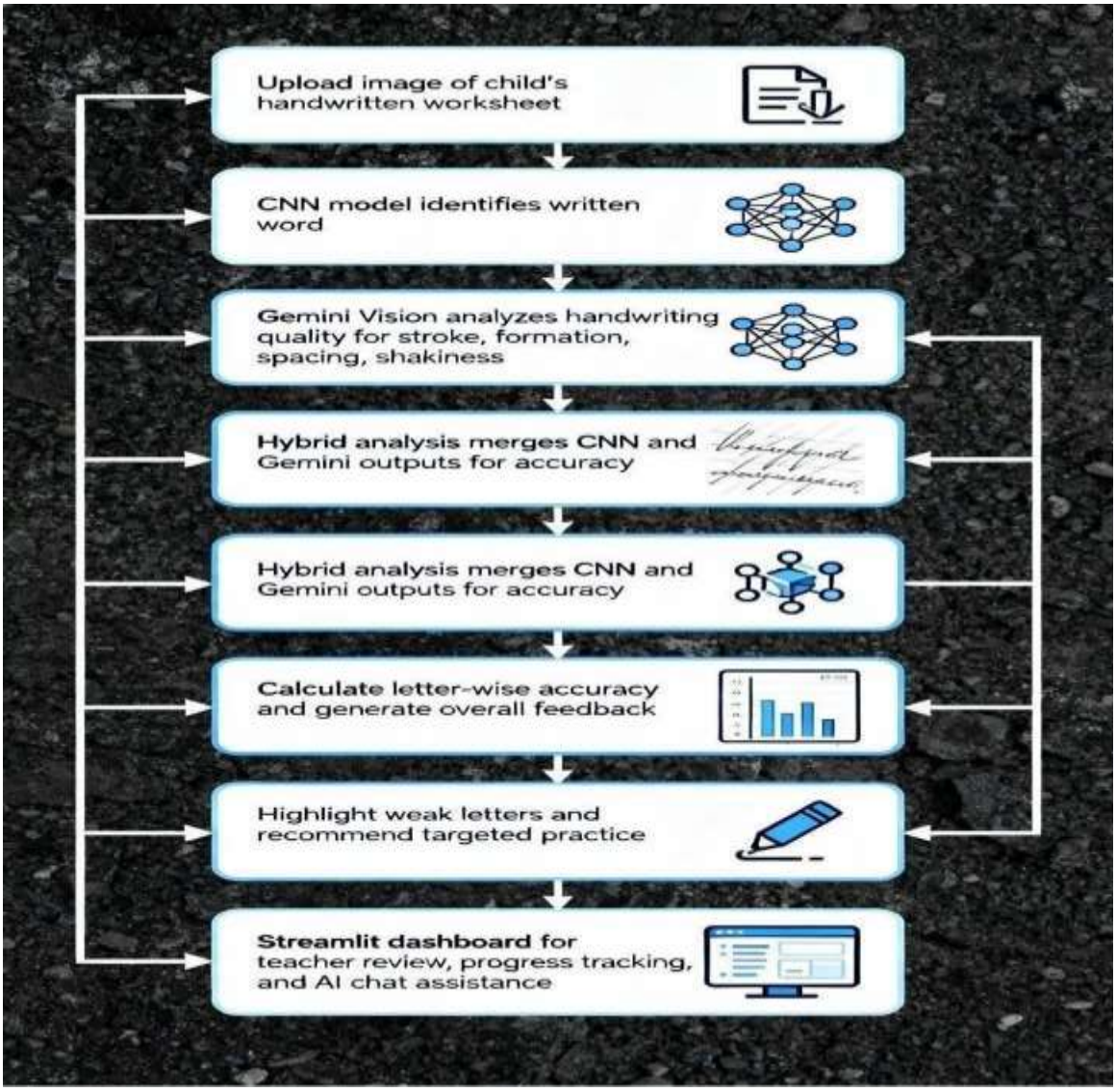

Figure 1: Flowchart model.

Advantages.: There would be better accuracy and personalized learning to each and every child present in the class instead of giving A1 single homework to each and every person and not even looking that whether the child is improving or not there would be. Retail
feedback and also a progress would be saved of the child so that the teacher can track whether the child is improving or decreasing its ability.
Extra features: There would be an AI teaching assistant that is going to. Help the teachers to make the learning personalized and also helps the child to get into improvement of their motor skills. Also there is a chart mod section where the teacher is going to try or can ask the questions to the board like how can I improve the performance of that particular child at the bot is going to tell the answers based. On the child's data that the teacher is asking for as we have saved the data in our database.
System workflow:
Step 1. Upload handwriting image.
Step 2. CNN predicts word.
Step 3. Gemini vision analysis to correct what has been predicted our model by our model. Step 4. Quality analysis of the handwriting and also feedback given. Hmm.
Step 5. Generate letter wise score plus feedback.
Step 6. Highlight weak areas.
Step 7. Recommend practice.
Step 8. Show results on dashboard.
Step 9. Asking chatbot for personalized teaching strategies.

There is personalized teaching AI assistant that helps the teacher to give the personalized attention to each and every student present in the class. The interface is basically made of Streamlight as we are more focused on the bracket. There would be an AI teaching assistant that is going to. Help the teachers to make the learning personalized and also helps the child to get into improvement of their motor skills. Also there is a chart mod section where the teacher is going to try or can ask the questions to the board like how can I improve the performance of that particular child at the bot is going to tell the answers based. On the child's data that the teacher is asking for as we have saved the data in our database.

3. Research Methodology

Objective: There are some existing solutions in the market but they are not for special child therefore normal childs to improve their handwriting but this solution is basically helping children special child with disabilities like MRCP and IP these helps the child to get the personalized assistance from the teacher and also is also we are able to track their progress over time. This solution assists the teachers to grab the. In child's personalized attention and also to check whether the child is performing well overtime or not.
System Components: There are we are. We are using CNN models for word recognization. Again a CNN model with softmax function for. Ohh image classification like each and every word is given a percentage and for that percentage given we are using softmax function then we are using Gemini vision to check whether the generated response is correct or not and also. Giving the feedback to the teacher and motor skills observations, A detailed analysis is there. There would be a hybrid model. Basically either you can

make the detection perfectly model based that we have build or we can enable the function the Gemini 1 to check whether the predictions.
Key features: There are letter wise scoring that is basically when the image is been uploaded then each and every letter is given a score like how much correct the letter is being written. There would be an error detection like what type of error the child. Is uh making continuously there would be motor skill analysis? Like what are the specific motor skills that are to be triggered in the child so that they can improve further? There are some practical suggestions also like how the teacher can improve the progress of the child. And there would be an AI assistant that is going to assist the teachers. The teachers can ask the personalized teaching strategies so that AI only.
Benefits :
1. Faster evaluation
2. Consistent results
3. Personalized learning

4. Result Analysis
Users: Special child teachers, parents, therapists, schools.
Benefits: For children, we are going to improve their handwriting and their motor skills. That is essential for their therapy. There would be a personalized therapy for each and every child, and each and every child would be given a special attention. According to their needs, we will get clear feedbacks from our system. For teachers. for teachers This is going to save a lot of time and efforts focusing more on teaching and personalization for the child and helps the teacher to improve the ability of the child they are teaching. Instead of giving the whole one homework to the class, they can give attention to each and every child personally.
For parents, they are going to understand their child's progress and what their child basically needs, how their child is improving or whether they are not improving in the motor skills.
Therapists. Therapist Therapist are going to analyze the child's motor skills and also what things are they lagging behind and also what things they are suffering from for example an ADHD. While it is hyperactive or is way more. Speedy, so it skips the basic strokes in the letters. For example, in letter T while writing the letter T, they might skip the stroke of the T letter.
System output: There would be word prediction accuracy. Each and every word is predicted correctly and letter wise score is being given so that we can analyze the which particular letter the child is making the mistakes continuously. There would be personalized feedback. A motor skill observations and also the progress tracking so that the teacher can maintain the record and show to the parents whenever it is needed.
System implementation: The teacher uploads the image of the writing of the student and then that image is being converted into 28 X 28 pixels. Each and every pixel is given as an input to our model and then our. CNN model analyzes it and it takes what the word is. The next layer is the CNN softmax layer that basically gives a score to each and every word and tells which particular word word the child is making the mistakes more. There would be a student dashboard where the teacher can check the progress of the child and even save the progress of the child and there would be motor skill observations and feedbacks according to the child. Also there is a chart board where the teacher can ask the personalized. Coaching strategies for that particular channel.

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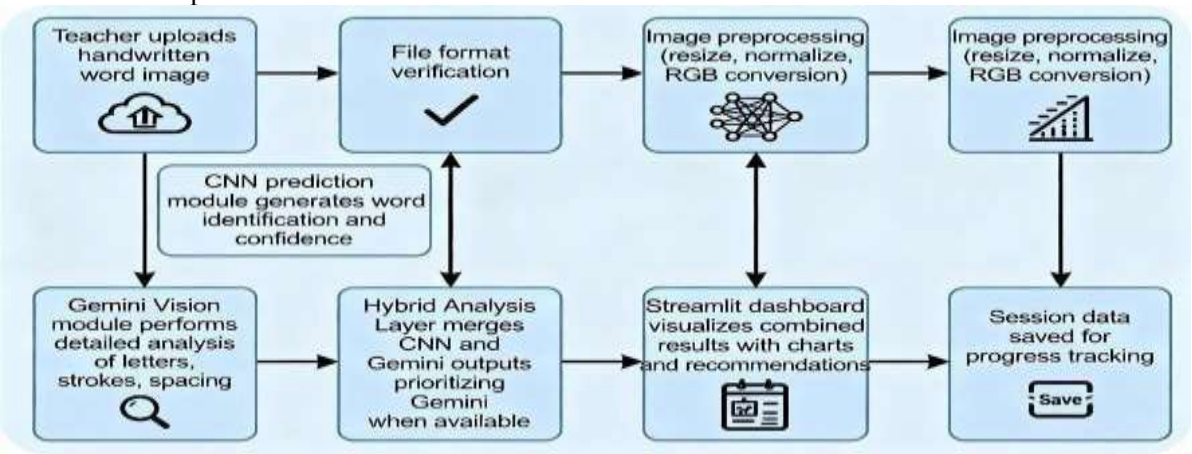

Figure 2: System Architecture and Workflow

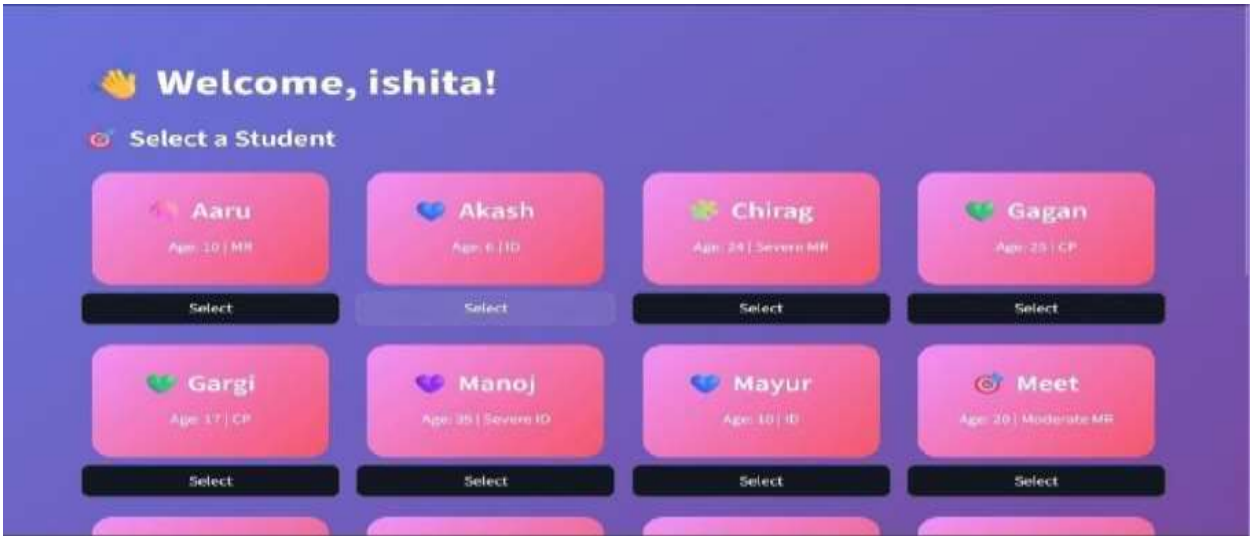

Figure 3: Student Selection Dashboard

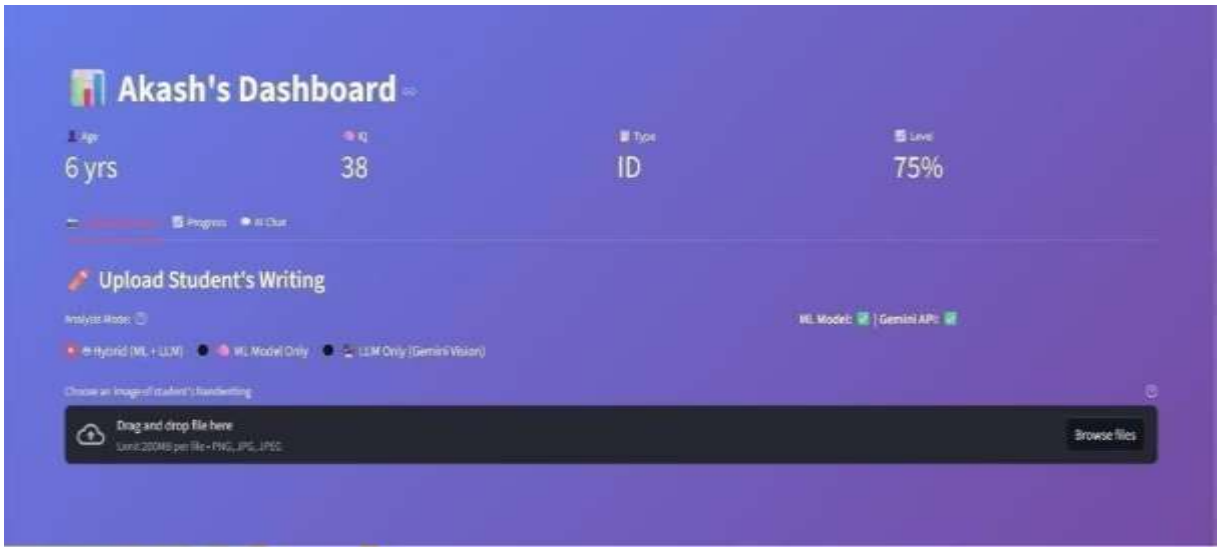

Figure 4: Student Dashboard Overview

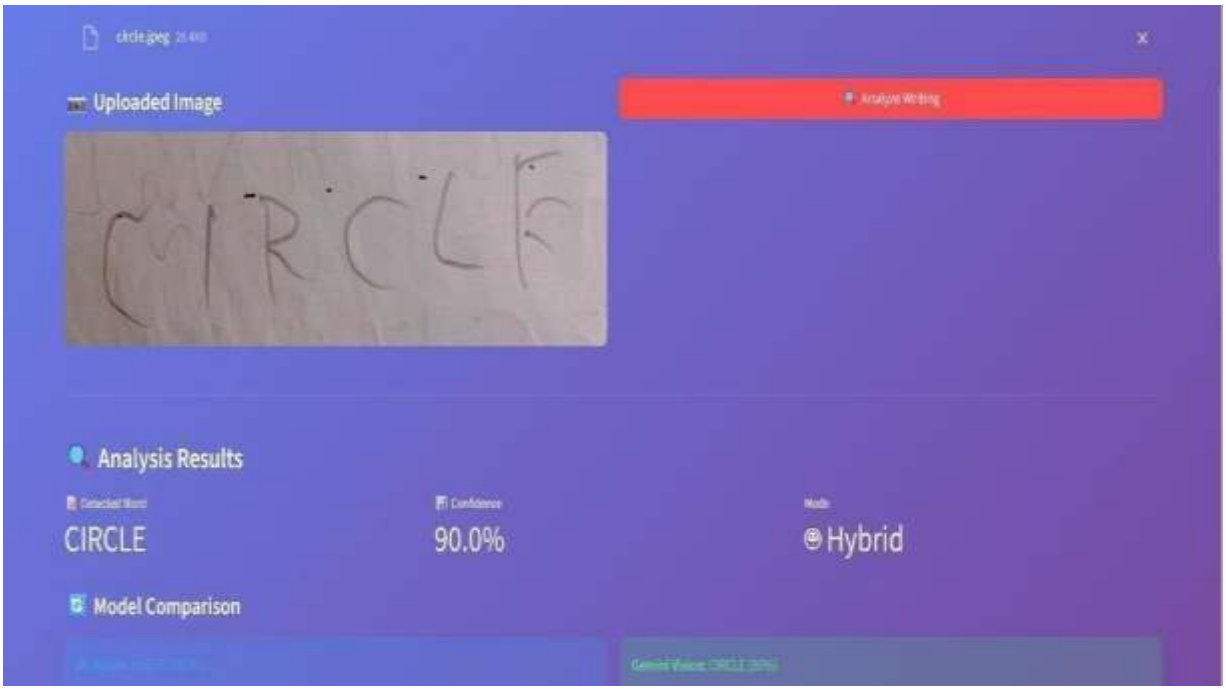

Figure 5: Handwriting Upload And Recognition Results

Figure 6: Letter-By-Letter Score Analysis

5. Conclusion and Future Work

We are able to solve the major problem in the society to give equality to the children with the special disabilities. The system is going to be very personalized for the child. That is OHH suffering from any of the disability. For each and every child, there would be a personalized attention that is being provided by the teacher and there is combination of CNN Gemini that is going to help us here. We provide accurate handwriting analysis where each and every word is being analyzed. Directly by our AI system, the teachers workload is being reduced and there would be a lot of help that can that they can have from this particular app. There is an improvement in learning of the special child and also in the motor skills. That therapy it's it's supports educational inequality. Also, there are some features that can be added in future and we are also progressing with it, that is to add the Hindi data set in the system. And voice features.

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