KIET GROUP OF INSTITUTIONS
Connecting Life with Learning
www.kiet.edu
Delhi-NCR, Ghaziabad

Computerized Cognitive Retraining Program for Home-Based Learning in Children with Special Abilities

Team- Manashi Banerjee , Hariom Chaudhary , Hemant Chaudhary
Mentor: Abhishek Kumar

Course Outcome (CO)	Mapped PO(s)	Justification	Mapped PO Values
CO1: Analyze and understand the real-life problem and apply their knowledge to get programming solution.	PO1, PO2, PO4, PSO1	Our project tackles a real-world issue (inclusive education) and applies AI/computer vision to design a software-based solution	PO1 − 3, PO2 − 3, PO4 − 3, PSO1 − 3
CO2**:** Engage in the creative design process through the integration and application of diverse technical knowledge and expertise to meet customer needs and address social issues.	PO3, PO6, PO8, PO9, PSO1, PSO2	The system combines AI, computer vision, GDPR compliance, and UX for children with cognitive differences—a strong societal and technical integration.	PO3 – 3, PO6 – 3, PO8 – 2, PO9 – 2, PSO1 – 3, PSO2 – 3
CO3: Use various tools and techniques, coding practices for developing real life solution to the problem.	PO5, PO1, PO10, PSO1	You are using tools like React, Node.js, computer vision, emotion detection, dashboards, etc., as part of a real-life application.	PO5 – 3, PO1 – 2, PO10 – 2, PSO1 – 3

Result:

FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 **APPLICATION FOR GRANT OF PATENT** (See section 7, 54 and 135 and sub-rule (1) of rule 20)		(FOR OFFICE USE ONLY)
	Application No.	
	Filing date:	
	Amount of Fee paid: CBR No:	
	Signature:	
1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)		

2. TYPE OF APPLICATION [Please tick (√) at the appropriate category]					
Ordinary (√)		Convention ( )		PCT-NP ( )	
Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )	Divisional ( )	Patent of Addition ( )

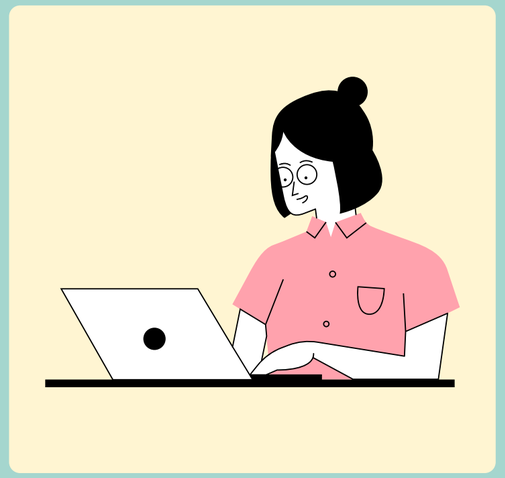
3A. APPLICANT(S)

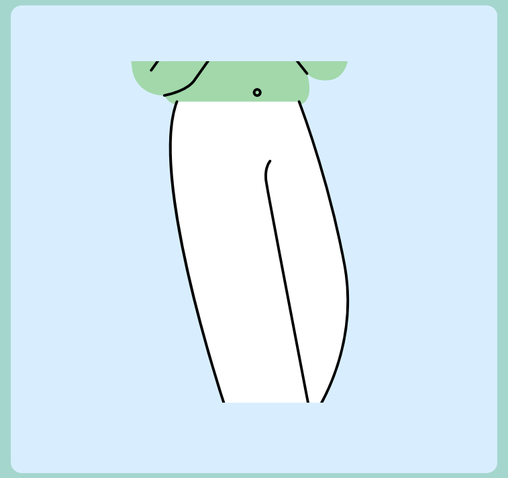
Name in Full	Nationality	Country of Residence	Address of the Applicant
1. Mr. Abhishek Kumar	Indian	India	Department of CSE AIML, KIET Group of Institutions, Delhi NCR, Ghaziabad, Uttar Pradesh, India-201206
2. Ms. Manashi Banerjee	Indian	India	Department of CSE AIML, KIET Group of Institutions, Delhi NCR, Ghaziabad, Uttar Pradesh, India-201206
3. Mr. Hemant Chaudhary	Indian	India	Department of CSE AIML, KIET Group of Institutions, Delhi NCR, Ghaziabad, Uttar Pradesh, India-201206
4. Mr. Hariom Chaudhary	Indian	India	Department of CSE AIML, KIET Group of Institutions, Delhi NCR, Ghaziabad, Uttar Pradesh, India-201206

3B. CATEGORY OF APPLICANT [Please tick (√) at the appropriate category]

Problem Statement:

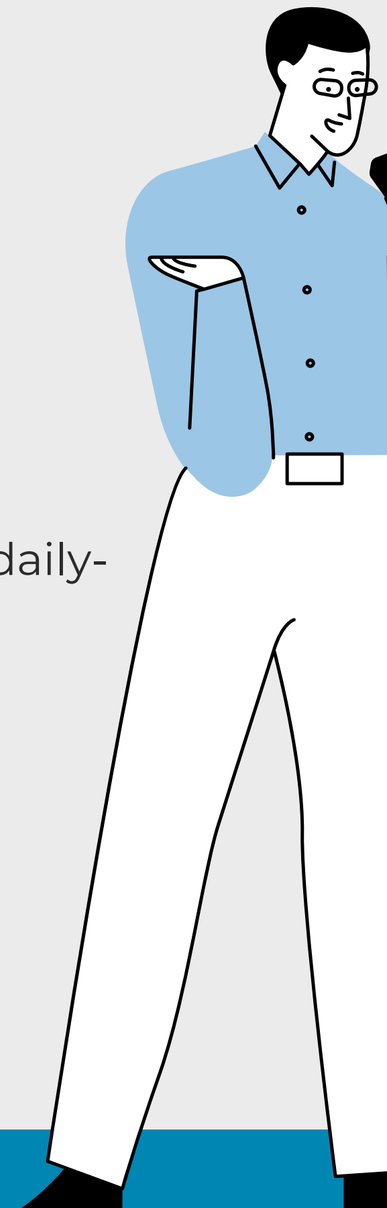
- Children with disabilities face challenges accessing cognitive retraining programs due to limited home-based options, highlighting the need for a computerized solution tailored to their needs to enhance learning outcomes and promote inclusion.





Current Problem-

- Pandemic led to cognitive decline in students (Reffiane et al., 2021).
- Parents require inclusive classes for their children to prepare them face the real world.
- Students in constant need of guardian for assistance, creating problems for guardian to do daily-life tasks and their jobs.
- Teachers face challenges with varying numbers of special needs students.
- Urgent need for tailored support and innovative strategies to address academic impacts.



KIET GROUP OF INSTITUTIONS
Connecting Life with Learning
www.kiet.edu
Delhi-NCR, Ghaziabad

Solution-

- Implement a milestone based learning platform.Each milestones tailored to criteria to judge the student's ability.
- Promotes inclusive, supportive classroom environments.
- Real-time guardian dashboard with progress & suggestions, to judge the actual progress made by the student.

Objectives-

01. Milestone-based personalized learning paths

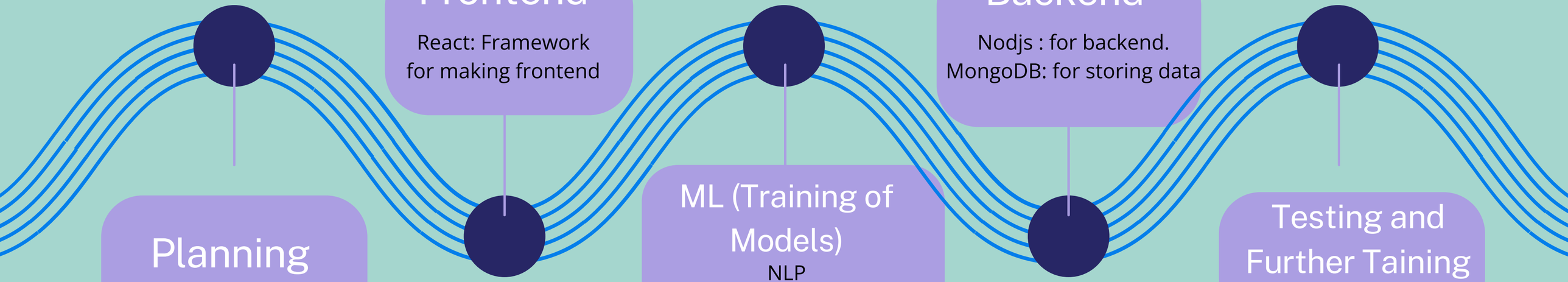
02. Detects guardian assistance during sessions

03. Promotes inclusive, supportive classroom environments

04. Milestone-based personalized learning paths

KIET GROUP OF INSTITUTIONS
Connecting Life with Learning
www.kiet.edu
Delhi-NCR, Ghaziabad

Project Timeline-



Planning
and Designing Architecture

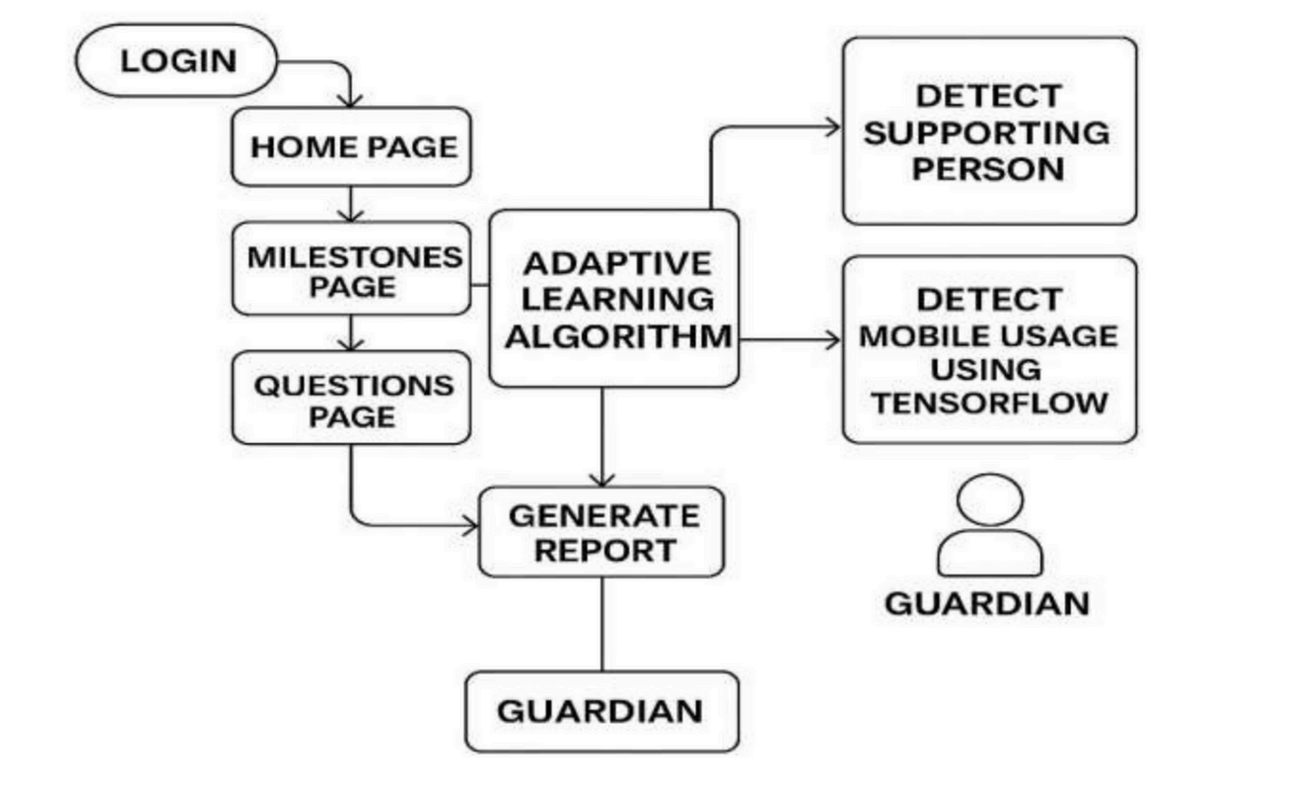
Frontend
React: Framework for making frontend

ML (Training of Models)
NLP
Computer Vision

Backend
Nodjs : for backend.
MongoDB: for storing data

Testing and Further Taining

Data Flow:


LOGIN
HOME PAGE
MILESTONES PAGE
QUESTIONS PAGE
ADAPTIVE LEARNING ALGORITHM
DETECT SUPPORTING PERSON
DETECT MOBILE USAGE USING TENSORFLOW
GENERATE REPORT
GUARDIAN
GUARDIAN

LITERATURE REVIEW

Sr.No.	Journals	Year	Techniques	Conclusion
1.	**Remote Learning, COVID-19, and Children With Disabilities**	**2021**	Surveys + interviews (qualitative analysis)	◦ Lost access to special support & services ◦ Increased learning inequality ◦ Urgent need for inclusive, flexible systems

LITERATURE REVIEW

Sr.No.	Journals	Year	Techniques	Conclusion
2.	An Integrative Approach to Improve Students' Cognitive Ability Through Online Learning in The Covid-19 Pandemic	2022	Integrated Learning	○ Identified decline in students' cognitive abilities during Covid-19 online learning. ○ Significant increase in students' cognitive x observed through integrated learning. ○ Pre-test average score: 32.17; Post-test average score: 48.47.

LITERATURE REVIEW

Sr.No.	Journals	Year	Techniques	Conclusion
3.	Academic Progress of Students Across Inclusive and Traditional Settings	2013	It was an article paper.	○ Students without disabilities in inclusive settings made significant academic progress in math and reading. ○ Students with disabilities, including those with specific labels like learning disabilities and mild mental handicaps, also showed academic progress in inclusive education. ○ Overall, inclusive education benefits both students without disabilities and those with disabilities in terms of academic progress and achievement.

LITERATURE REVIEW

Sr.No.	Journals	Year	Techniques	Conclusion
4.	**Home-Based Computer-Assisted Cognitive Training**	**2015**	Data Analysis, randomized controlled trial	○ **Home based education have more better results over clinic based education.** ○ **Number of hours / time given to the training effects the progress of a student.**

LITERATURE REVIEW

Sr.No.	Journals	Year	Techniques	Conclusion
5.	**Experiences of Teachers of Students With Disabilities and Extensive Support Needs During COVID-19**	**2024**	Search – MEDLINE, PsycINFO, Web of Science. CONSORT for analysis.	◦ Instructional Challenges: Teachers struggled to adapt specialized instruction and provide necessary support remotely. ◦ Family Dependency: Educators relied on families to act as paraprofessionals, leading to inconsistent student support. ◦ Administrative Support: Lack of clear guidance and resources from administrators exacerbated teaching difficulties. ◦

LITERATURE REVIEW

Sr.No.	Journals	Year	Techniques	Conclusion
6.	A systematic review of pediatric cognitive rehabilitation in the elementary and middle school systems	2015	integrated learning , problem solving , reasoning.	This systematic review identifies several avenues for effective therapeutic interventions for school aged TBI survivors. Many are supported by laboratory based efficacy studies. Future research should investigate optimal ages for particular treatments, as well as, the effectiveness of treatments across different social settings.

LITERATURE REVIEW

Sr.No.	Journals	Year	Techniques	Conclusion
7.	Does Access Matter? Time in General Education and Achievement for Students With Disabilities	2013	Data Analysis	This study examined the relationship between hours in general education and achievement in reading and mathematics for students with disabilities.

KIET GROUP OF INSTITUTIONS
Connecting Life with Learning
www.kiet.edu
Delhi-NCR, Ghaziabad

Thank you very much!

Team- Manashi Banerjee , Hariom Chaudhary , Hemant Chaudhary
Mentor: Abhishek Kumar