CSE7101- Capstone Project

Review-1

Computerized Cognitive Retraining Program for Home Training of Children with Disabilities

Batch Number:CSE_196

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Content

- Problem Statement
- Objectives
- Background and Related work for title Selection
- Analysis of Problem Statement
- Innovation or Novel Contributions
- Git-hub Link
- Timeline of the Project
- References

Problem Statement Number:

Organization: Presidency University

Category (Hardware / Software / Both) : Software

Problem Description:

Many children with cognitive disabilities require continuous training to improve memory, attention, reasoning, and problem-solving skills. Access to therapy centers is often limited by location, cost, and time constraints. Existing training approaches lack gamification, progress tracking, and adaptive difficulty, which are crucial for sustained engagement and measurable improvement.

Objectives:

1. Create a software that helps children improve thinking skills at home.
2. Add fun, game-like activities to keep them motivated.
3. Adjust the difficulty automatically based on how the child is doing.
4. Let parents and therapists check progress easily.
5. Reduce the need for visiting therapy centers often.

Background and Related work for title selection:

Reason for Title Selection: The chosen title reflects the project's focus on home-based, gamified, and adaptive cognitive retraining—addressing both accessibility and personalization.

Children with cognitive disabilities such as ADHD, autism, or developmental delays often face challenges in memory, attention, and problem-solving. Consistent cognitive training can help strengthen these skills, but access to specialized therapy centers is limited.

Research Evidence: Studies have shown that computer-based cognitive training can significantly improve attention span, working memory, and reasoning skills in children with developmental disorders.

Analysis of Problem Statement

Challenges Identified:

Lack of engaging, child-friendly, localized cognitive training software.

Inconsistent training in absence of structured digital tools.

Difficulty for therapists to monitor home-based progress remotely.

Proposed Solution:

An interactive cognitive retraining program with adaptive learning, offline access, and a reporting dashboard for caregivers and therapists.

Regular content updates, clinical collaboration, and strong data security will ensure effectiveness, safety, and sustained use.

Analysis of Problem Statement (contd...)

Technology Stack Components:

Frontend: HTML5, CSS3, JavaScript / React.js

Backend: Node.js or Django

Database: MySQL / MongoDB

Libraries/Tools: Speech synthesis API, Chart.js for graphs

Platform: Web-based, tablet/laptop compatible

Analysis of Problem Statement (contd...)

Software and Hardware Requirements

Software:

OS: Windows / Linux / macOS

Browser: Chrome, Firefox

Frameworks: Node.js / Django

Database: MySQL / MongoDB

Hardware:

Processor: Dual-core or higher

RAM: 4GB minimum

Storage: 500MB free space

Github Link

Github Link

https://github.com/Ruchith04/Capstone-Project-CSE_196

Innovation or Novel Contributions

Gamified Therapy: Makes training fun, increasing child participation.

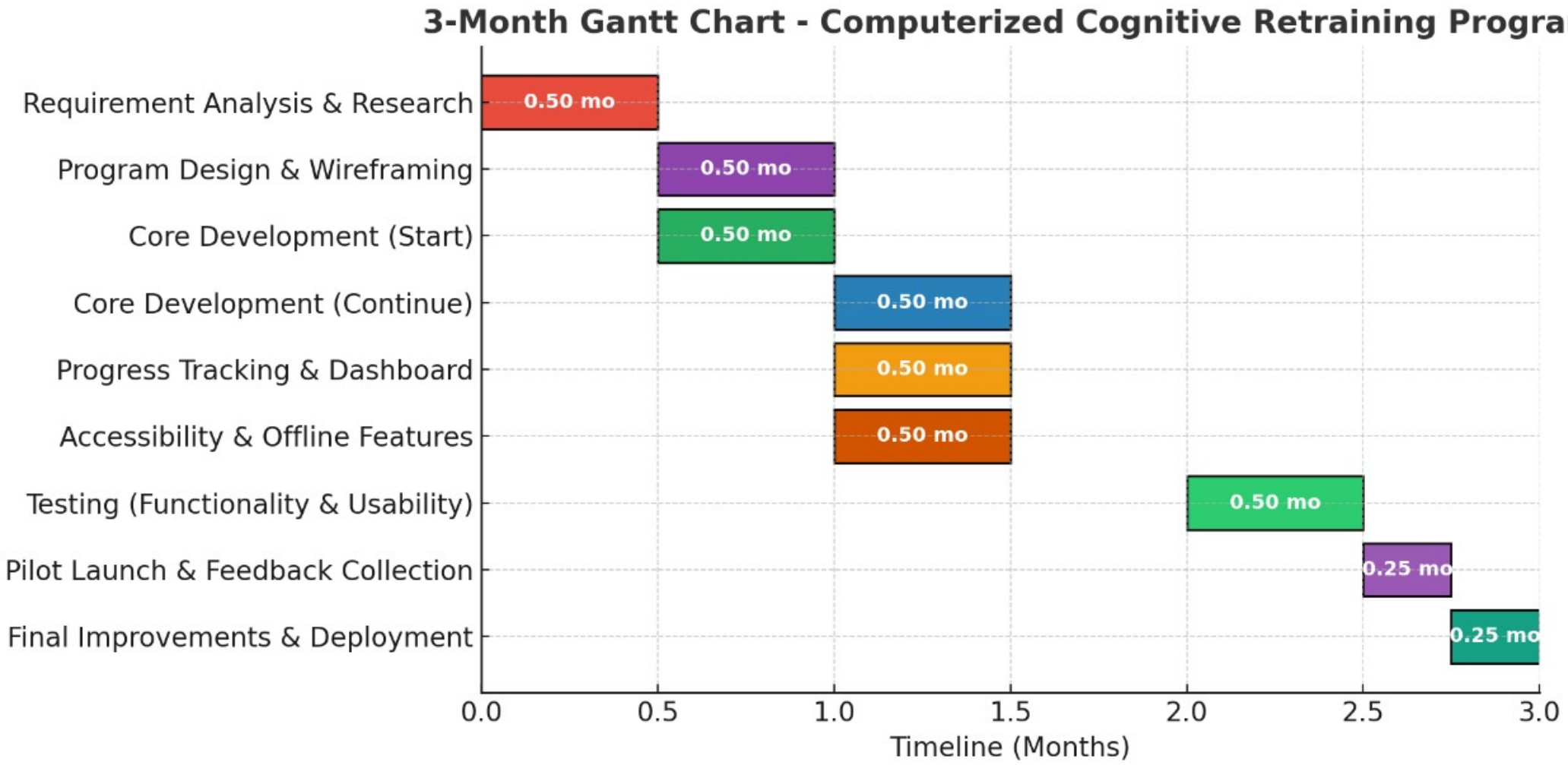
Adaptive Learning: Real-time difficulty adjustment.

Offline Capability: Works without constant internet.

Progress Visualization: Graph-based reports for stakeholders.

Parent/Therapist Dashboard: Enables personalized training schedules.

Timeline of the Project (Gantt Chart)



References (IEEE Paper format)

[1] M. Prensky, “Digital game-based learning,” Computers in Entertainment, vol. 1, no. 1, pp. 21–21, Oct. 2003.

[2] H. A. Abbasi and M. A. Salehnia, “An adaptive e-learning system based on cognitive style,” IEEE Transactions on Education, vol. 54, no. 4, pp. 707–714, Nov. 2011.


Thank
You!