Detection Of Speech Level Disorder In Children

(Group No. - 40)

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Internship Status

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Internship Duration	01-07-2023 to 31-07-2023
Submitted Certificate On IT-Moodel Server	Yes
Submitted Internship Report On IT-Moodel Server	Yes

Internship Status

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Internship Duration	29-08-2023 to 04-10-2023
Submitted Certificate On IT-Moodel Server	Yes
Submitted Internship Report On IT-Moodel Server	Yes

Major Project Introduction

Introduction :-

The objective is clear: to create a diagnostic system that can detect a wide spectrum of speech impairments in children. Armed with cutting-edge machine learning models, including Convolutional Neural Networks (CNN) and deep learning, and embracing a multimodal approach that combines speech data with facial expressions and physiological measurements, the project aims to provide precise and diverse assessments.

Objective :-

- **Dataset Development:** Create a diverse and representative dataset of children's speech recordings, encompassing participants from various age groups and a wide spectrum of speech impairments.
- **Machine Learning Model Implementation**: Develop, train, and optimize advanced machine learning models, particularly Convolutional Neural Networks (CNN), to analyze speech data accurately.
- **Diagnostic Assessment**: Create an automated diagnostic system that can analyze speech recordings and provide comprehensive assessments, including identifying the type, severity, and progress of speech impairments.

- **Early Intervention Recommendations:** Develop a data-driven framework that generates tailored recommendations for early intervention and treatment plans based on the specific speech impairments detected in each child. Ensure that recommendations are continuously updated based on real-time monitoring.

- **User-Friendly Interface**: Design an intuitive and user-friendly interface for healthcare providers, speech therapists, and educators to facilitate the use of the diagnostic system and interpretation of results. The interface should also include real-time monitoring dashboards.

- **Clinical Validation:** Conduct extensive validation and testing of the diagnostic system's effectiveness and reliability in a clinical setting. Use a diverse cohort of children and assess the real-time monitoring capabilities for dynamic adjustments in intervention plans.

- **Expert Collaboration:** Collaborate with speech pathologists, pediatricians, and specialists in the field to ensure that the project aligns with best practices and standards in speech pathology. Gather expert feedback on real-time monitoring features.

Methodology :-

The initial phase will focus on extensive literature review to gather insights into the state-of-the-art in speech impairment detection methods.

Subsequently, data collection protocols will be established, encompassing the ethical acquisition and management of speech data from children.

Machine learning models, including deep learning approaches such as convolutional neural networks (CNNs), will be developed to analyze speech patterns and identify impairments.

Real-time monitoring capabilities will be integrated into the system to enable continuous assessment.

Extensive testing and validation will be conducted to ensure the system's accuracy and robustness, with feedback loops for refinement.

The project will involve collaboration with speech pathologists, educators, and healthcare professionals to ensure the system's practicality and relevance in clinical and educational settings.

Ethical considerations and legal compliance, especially regarding data privacy, will be adhered to throughout the project.

Major References to Justify Title of Project

Some research papers used for reference are listed below :-

- Speech databases of typical children and children with SLI.

  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4786280/

- Speech-Language Impairment: How to Identify the Most Common and Least Diagnosed Disability of Childhood.
- Real-Time Monitoring of Speech Development in Children with Impairments.
- Machine Learning Approaches for Speech Impairment Diagnosis in Children.
- Early Diagnosis of Speech Sound Disorders in Children.