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Healthcare - Autism Predicting Tool Using Data Science / AI / ML

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Abstract: ***This study presents a comprehensive analysis of the application of machine learning techniques for the prediction of autism spectrum disorder (ASD). The dataset used in this research comprises a range of demographic, behavioral, and diagnostic features. The study focuses on the use of various machine learning algorithms, including limited decision trees, support vector machines, and neural networks, to predict the likelihood of ASD in individuals.***
In addition, engineering and feature selection strategies are investigated to determine the most pertinent characteristics for precise prediction. Metrics like accuracy, sensitivity, specificity, and area under the receiver operating characteristic (ROC) curve are used to assess how well various algorithms perform.
Results show promising potential for the utilization of machine learning models in predicting ASD, with certain algorithms exhibiting superior predictive capabilities. The findings of this study provide valuable insights into the potential use of machine learning in the early detection and intervention of autism, ultimately contributing to improved outcomes for individuals on the autism spectrum.
Keywords: Data Analytics, Machine Learning

I. INTRODUCTION

Autism spectrum disorder (ASD) is a complex neurodevelopmental condition characterized by challenges in social interaction, communication, and repetitive behaviors. Early detection and intervention significantly impact the long-term outcomes for individuals with ASD, prompting the exploration of advanced techniques for prediction and diagnosis. In recent years, machine learning has emerged as a powerful tool in healthcare and has shown great potential in predicting and identifying neurological conditions.

II. RELATED SYSTEM

[1] Autism Spectrum Disorder Screening Tools by Diana Robins, Deborah Fein, & Marianne Barton. This comprehensive resource provides various screening tools and assessments used in the diagnosis and evaluation of autism spectrum disorder (ASD).
WEBLINKS:
www.autismspeaks.org/screen-your-child
In existing autism screening systems, assessments are typically conducted manually, relying on standardized screening tools such as the M-CHAT-R/F. These tools require trained professionals to administer and interpret the results, often involving extensive paperwork and record-keeping.
[2] Machine Learning in Healthcare: A Review by Marzyeh Ghassemi, Tristan Naumann, Peter Schulam, Andrew L. Beam, & Rajesh Ranganath. This review paper explores the applications of machine learning in healthcare, including predictive modeling for disease diagnosis and prognosis.

III. PROPOSED SYSTEM

The proposed Autism Prediction system is designed to be highly flexible and efficient, facilitating seamless interactions with users. With a paramount focus on data security, particularly given its online nature and network transfer, robust measures are implemented to ensure the confidentiality and integrity of sensitive information.
The proposed Autism Prediction system represents a significant advancement in the field of autism diagnosis and intervention. With its emphasis on flexibility, security, speed, and accuracy, the system is poised to revolutionize the way autism is predicted and addressed. By harnessing the power of .NET and SQL technologies, the system offers a robust and sustainable solution for improving outcomes for individuals with autism spectrum disorder.

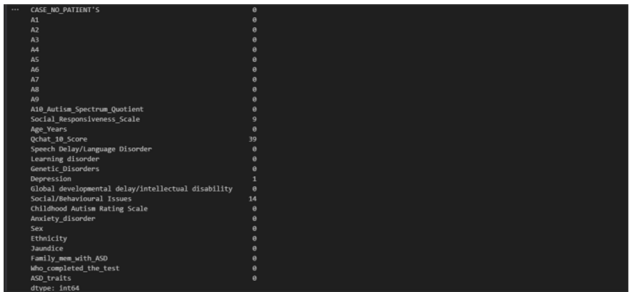
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Following are some of the enhancements proposed to be implemented in final version.

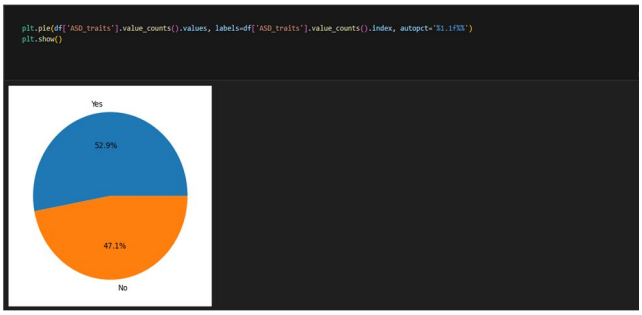
1) Cross-platform Compatibility.
2) Interactive Visualization Tools.
3) Multi-language Support.
4) Advanced Machine Learning Models
5) Continuous Model Improvement

IV. METHODOLOGY

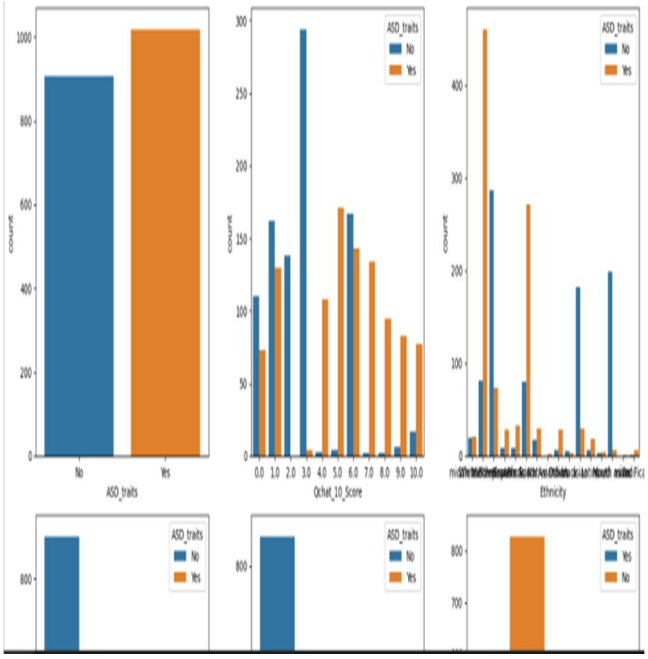
1) Data Cleaning:



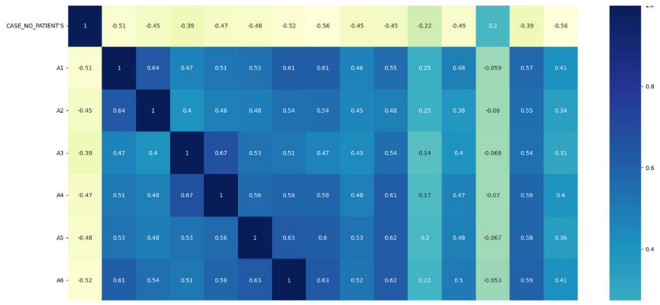
2) Exploratory Data Analysis (Eda):



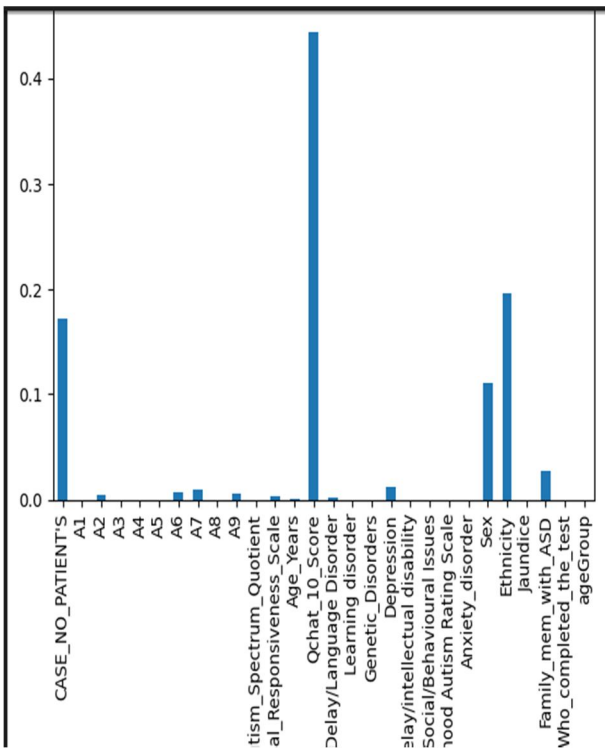
3) Feature Engineering:

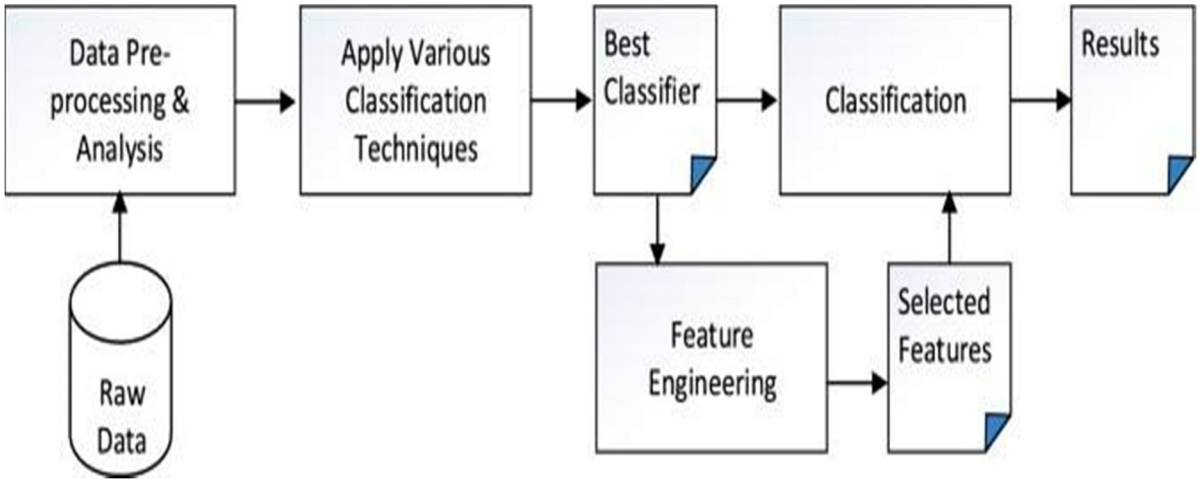


4) Correlation Matrix:



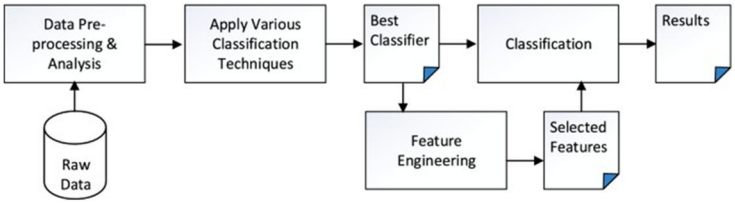
5) Feature Importance**:**





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V. SYSTEM ARCHITECTURE



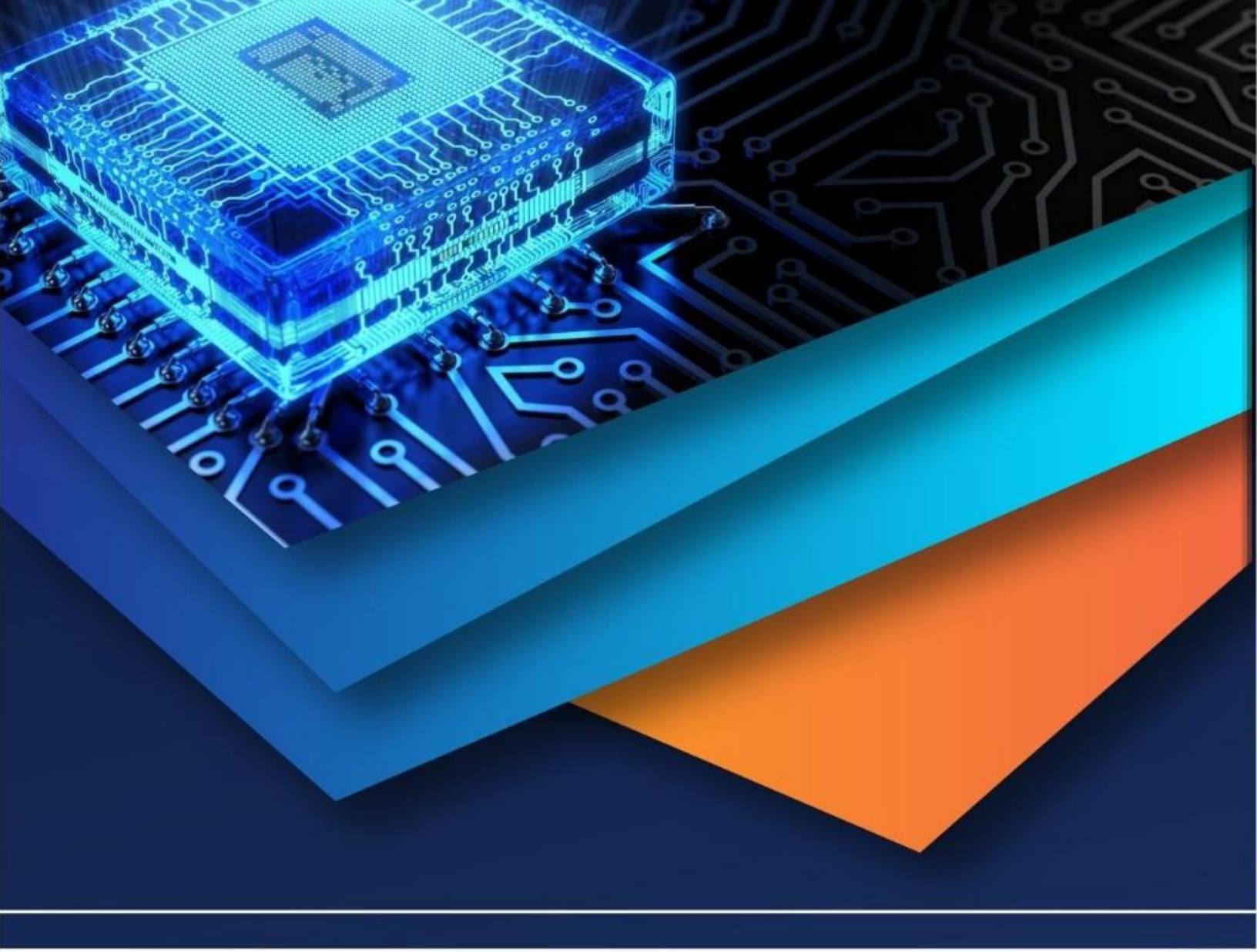
VI. CONCLUSION

The Autism Prediction with ML project offers a promising solution for early detection and intervention in autism spectrum disorder. Through machine learning algorithms and data analysis, the system provides accurate predictions based on diverse input features. With user-friendly interfaces and robust security measures, it aims to assist healthcare professionals and caregivers effectively. Proposed enhancements aim to further improve functionality and accessibility. Overall, the project holds great potential to positively impact individuals with ASD and their families, fostering early intervention and improved outcomes.

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