



Wellminds Fordel - A Model Serving as a Foreman for Mental Health

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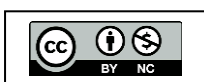
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Abstract: *The project proposes a novel approach to assess childhood depression severity through the integration of machine learning algorithms, specifically Support Vector Machines (SVM), and the Patient Health Questionnaire-9 (PHQ-9). Depression among children is a growing concern globally, yet its detection and severity assessment remain challenging. Leveraging the power of machine learning, this study aims to develop a predictive model capable of analyzing responses to a set of questions related to depressive symptoms and providing an output indicating the severity of depression. By training the model on a dataset comprising responses from children diagnosed with varying degrees of depression, including moderate and severe cases, the SVM algorithm, along with PHQ-9 and other relevant algorithms, will learn to recognize patterns indicative of different levels of depression severity. The output will categorize children's depression into levels such as moderate, mild, or severe, enabling early intervention and tailored support strategies. This project holds significant promise in augmenting traditional diagnostic methods with efficient, scalable, and objective assessment tools, facilitating timely interventions and ultimately improving the mental health outcomes of children worldwide. The Wellminds Fordel application not only determines if someone is suffering from depression but also identifies the specific type of depression they may be experiencing, recognizing that depression can manifest in various forms. This solution is intended for everyone, particularly individuals who may struggle to express their mental health concerns or choose to conceal them from others. By offering an accessible and discreet means of assessment, Wellminds Fordel aims to assist individuals in understanding and addressing their mental health issues effectively.*

Keywords: Childhood Depression, Machine Learning Algorithms, Support Vector Machines (SVM), Patient Health Questionnaire-9 (PHQ-9), Depression Severity Assessment, Predictive Model, Early Intervention, Tailored Support Strategies, Dataset, Patterns Recognition, Objective Assessment Tools, Mental Health Outcomes, Wellminds Fordel Application, Discreet Assessment, Timely Interventions.

I. INTRODUCTION

In the realm of childhood mental health, where early intervention is paramount, the "Wellminds Fordel – A Model Serving as a Foreman For Mental Health Wellness" project stands as a beacon of innovation and hope. Childhood depression, a pressing concern worldwide, often eludes detection due to its nuanced presentation and societal taboos. Recognizing this critical need, our project embarks on a pioneering journey, integrating machine learning algorithms, including Support Vector Machines (SVM), and the Patient Health Questionnaire-9 (PHQ-9), to develop a revolutionary tool to





assess childhood depression severity. Through the seamless execution of a base questionnaire or the test icon, this project endeavors to bridge the gap between traditional diagnostic methods and modern technological advancements.

By engaging children directly and sensitively, our tool promises to unravel the complexities of childhood depression, offering clear insights into its severity. Named "Wellminds Fordel – A Model Serving as a Foreman For Mental Health Wellness," this endeavor not only signifies a technological leap but also embodies a compassionate response to the mental health needs of our youngest generation. In this presentation, we establish the groundwork for a groundbreaking excursion toward upgrading youth psychological well-being evaluation and mediation. As we dig further into the complexities of our undertaking, let us leave on a mission to engage youngsters, families, and networks with the devices and information expected to explore the scene of experience growing up despondency with flexibility and sympathy.

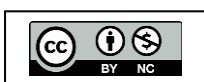
Psychological well-being is an expansive mark that includes mental, profound, social, and conduct work. Psychological well-being, as actual well-being, happens along a continuum from great to poor and changes after some time, in various circumstances, and at various ages [1-3]. Great emotional well-being in youngsters incorporates markers, for example, the opportune accomplishment of formative achievements, sound social and profound turn of events, and side effects that meet determined models [1]. Normal mental problems in youngsters incorporate uneasiness, gloom, attention deficit/hyperactivity jumble (ADHD), and conduct issues [8]. Great emotional well-being isn't just the shortfall of a psychological issue; people with analyzed mental problems can in any case have great emotional well-being (e.g., if getting sufficient treatment and backing) [3, 7, 9].

II. LITERATURE REVIEW

Lydia Plowman, [1] contributes to our understanding of research in home environments by attracting consideration regarding the shortage of research that gives a full record of youngsters' observations and encounters with innovation in the home. It describes a study of 3- and 4-year-old children's play and learning with toys and technologies in family settings and how an eco-cultural approach was enlisted as a framework for understanding the home's unique mix of inhabitants, learning opportunities, and resources. Techniques that are good with such a methodology are examined as far as how we settled on choices about the sorts of information that can assist us with understanding progressively family connections and exercises and, thusly, about youngsters' learning.

The system additionally offered shape to our elucidations of the information, empowering us to light up the complex of practices, qualities, and frames of mind and their crossing points with innovation. It finishes up by theorizing on a portion of the reasons why youngsters appear to be missing from numerous investigations of innovation in regular day-to-day existence and proposing a portion of the manners by which this might be helped.

We found huge contrasts between the two gatherings, regarding the extent and the recurrence of scenes of straightforwardly taking a gander at countenances amid the entire arrangement of examinations. Taciana Pontual Falcão, [3] Intellectual disabilities cause significant sub-average achievement in learning, which, from a socio-constructionist perspective, can be addressed by using



adequate tools. Nonetheless, the field needs centred examinations, as beginning exploration needs to date delivered generally nonexclusive outcomes. This article presents exact investigations where youngsters with scholarly inabilities cooperated with four unmistakable frameworks. The examination concentrated on kids' impressions of affordances and portrayal modalities.

Results demonstrated the transcendence of physical portrayals over computerized, and the significance of educational criticism to maintain a strategic distance from misguided judgments from seen physical affordances. Also, potential danger movement was decidedly connected to familial uneasiness chance, surprise scope of movement emphatically corresponded with kid disguising manifestations and reaction regulation movement was contrarily related to familial tension hazard. Results propose differential hypothesis-driven danger reaction stages and bolster past writing interfacing maternal youngster hazard to uneasiness with conduct estimates utilizing progressively possible target techniques.

III. PROPOSED METHOD

Assembling a diverse dataset of children's responses to the Patient Health Questionnaire-9 (PHQ-9) and pertinent demographic variables marks the initial step. Subsequent data preprocessing involves rectifying missing values and outliers. Training a Support Vector Machine (SVM) classifier to recognize patterns indicative of varying degrees of depression severity follows suit.

A rigorous evaluation of the classifier's efficacy, coupled with optimization techniques to bolster accuracy, is then undertaken. Upon validation, seamless integration of the trained SVM classifier into the Wellminds Fordel application enables real-time assessment of childhood depression severity. Ethical considerations are meticulously addressed, and continual refinement efforts ensure the model's efficacy and user-friendliness in bolstering children's mental health support.

IV. IMPLEMENTATION

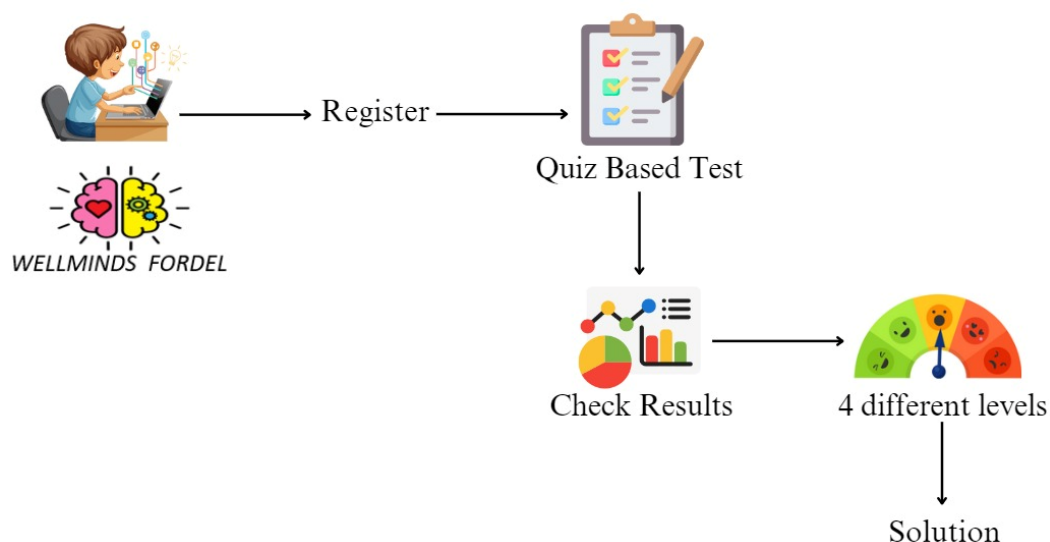


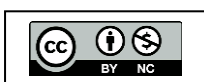
Figure 1: Model Implementation



Our system can be implemented as the following diagram by

- 1) Data Collection
- 2) Pre-processing the Data
- 3) Feature Selection
- 4) Model Training
- 5) Model Evaluation
- 6) Real-time Assessment
- 7) User Testing and Feedback
- 8) Deployment and Improvement

- **Data Collection:** Gathering a dataset containing relevant information, in this case, responses from children regarding their mental health status. This dataset serves as the foundation for developing and training the predictive model.
- **Pre-processing the Data:** Cleaning and preparing the collected data for analysis. This may include handling missing values, removing outliers, and transforming data into a format suitable for modelling.
- **Feature Selection:** This involves identifying the most relevant features or variables from the dataset that will be used to train the predictive model. This step helps improve the model's efficiency and performance by focusing on the most informative features.
- **Model Training:** Involves using machine learning algorithms, such as Support Vector Machines (SVM), to train the predictive model using the pre-processed data. During training, the model learns patterns and relationships within the data to predict children's mental health status accurately.
- **Model Evaluation:** Involves assessing the performance of the trained model using evaluation metrics such as accuracy, precision, recall, and F1-score. This step ensures that the model performs effectively and reliably in predicting children's mental health status.
- **Real-time Assessment:** Involves deploying the trained model to assess children's mental health status in real-time. This allows for immediate feedback and intervention based on the model's predictions.
- **Deployment and Improvement:** Involves deploying the model for widespread use and continuously monitoring its performance. Additionally, any feedback received from users is used to make iterative improvements to the model, ensuring its ongoing effectiveness in assessing children's mental health.





- **User Testing and Feedback:** Involves testing the model with users, such as children and caregivers, to gather feedback on its usability, accuracy, and effectiveness. User feedback is crucial for refining and improving the model.

V. PERFORMANCE EVALUATION

The table presents tailored solutions for children dealing with varying degrees of depression. For those experiencing no depression, encouraging outdoor play and creative activities, along with open communication with adults, can foster emotional well-being. Mildly depressed children benefit from speaking with trusted adults and engaging in group activities or hobbies. Moderate depression may necessitate professional counselling, creating safe spaces for expression, and scheduling regular social interactions.

For moderately severe cases, immediate support from counsellors, participation in support groups, and engaging in calming activities are essential. Severe depression warrants urgent professional intervention, accompanied by spending time with trusted adults and maintaining a healthy diet and routine. These recommendations aim to provide holistic support to children facing diverse challenges in managing their mental health.

Table 1: Model Output for Children's Mental Health

Depression Severity	Model Output	Children's Solutions
No Depression	"NO DEPRESSION"	Play outdoors
		Engage in creative activities
		Communicate openly with adults
Moderate Depression	"MODERATE DEPRESSION"	Seek professional counselling
		Create a safe space for expression
		Schedule regular playdates
Moderately Severe	"MODERATELY SEVERE	Seek immediate support from a counsellor
Depression	DEPRESSION"	Join a support group
		Engage in calming activities
Severe Depression	"SEVERE DEPRESSION"	Seek urgent help from a professional
		Spend time with trusted adults
		Ensure a healthy diet and regular meals

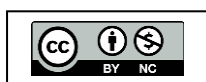


Table 2: Accuracy

Classifier	Accuracy
SVM	99.74%
Decision Tree	99.24%
Random Forest	99.59%
Naive Bayes	96.63%
KNN	99.60%

VI. CONCLUSION

Embracing the Wellminds Fordel model, this project pioneers a transformative approach to children's mental health. By leveraging tailored interventions aligned with varying degrees of depression, our model emphasizes the significance of personalized support. From advocating outdoor play and creative activities to fostering open communication and professional intervention when necessary, we empower children with holistic strategies for emotional well-being. Through the fusion of technology and compassionate care, the Wellminds Fordel model stands as a beacon of hope, championing a brighter future where every child's mental health is nurtured with empathy and understanding.

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