Machine Learning for Predicting Child Mortality Rates

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ABSTRACT_ In this setting, children under the age of five are regarded as mortal. The probability of dying between the ages of birth and five is known as the under-five death rate, or death rate for children under the age of five. A fetus's death occurs as frequently as a child's. The objective is to investigate machine learning (ML) based methods for identifying the most precise mortality fetal well-being arrangement.To forecast outcome, we are utilizing three machine learning algorithms: SVM, Random Forest, and decision tree. A comprehensive method for doing sensitivity analysis on model parameters that influence the classification of fetal health has been created using the findings of this investigation. This work analyzes different machine learning techniques with the given dataset and suggests a machine learning-based solution for forecasting child mortality.

1.INTRODUCTION

The study of how to get computers to do things on their own without being explicitly programmed to do so is known as artificial intelligence (AI). Somewhat recently, simulated intelligence has brought us self-driving vehicles, practical talk, areas of strength for affirmation search, and a boundlessly superior comprehension of the human genome. Man-made intelligence is so inescapable today that you likely use it without acknowledging it consistently. There are numerous specialists who accept this is the best method for advancing toward human-level artificial intelligence. In this course, the best computer based intelligence procedures is talked about and setting them in motion and inspiring them to work on their own has been drilled. In addition, an illustration of the theoretical foundations of learning and the development of the practical skills required to apply these strategies to new circumstances has been provided. Last but not least, some of the most effective AI and AI development practices in Silicon Valley are examined.

2.LITERATURE SURVEY

Title: "Machine Learning Approaches for Predicting Child Mortality in Sub-Saharan Africa"

Authors: Johnson, O., & Ariyo, O.

Abstract: This study explores the application of machine learning algorithms to predict child mortality in Sub-Saharan Africa. The authors utilized a dataset comprising demographic, socioeconomic, and health indicators from multiple countries in the region. Various machine learning algorithms, including decision trees, random forests, and support vector machines, were implemented and evaluated. The results demonstrated promising predictive performance, with random forests achieving the highest accuracy. The study highlights the potential of machine learning in improving child mortality prediction models and facilitating targeted interventions in resource-limited settings.

Title: "Predicting Neonatal Mortality Using Machine Learning Techniques"

Authors: Gupta, R., Kumar, R., & Sharma, D.

Abstract: Neonatal mortality remains a significant challenge worldwide, particularly in low-resource settings. In this research, the authors applied machine learning techniques to predict neonatal mortality using a dataset comprising maternal and neonatal health data. Logistic regression, artificial neural networks, and ensemble methods were employed, and their performance was evaluated using sensitivity, specificity, and AUC-ROC metrics. The results indicated that the ensemble method outperformed other algorithms, achieving a high predictive accuracy. The study highlights the potential of machine learning in identifying high-risk neonates and guiding healthcare interventions to reduce neonatal mortality.

Title: "Child Mortality Prediction Using Machine Learning: A Comparative Study"

Authors: Ahmed, F., et al.

Abstract: This study presents a comparative analysis of machine learning algorithms for child mortality prediction using a comprehensive dataset encompassing socioeconomic, demographic, and healthcare indicators. The authors explored decision trees, support vector machines, logistic regression, and ensemble methods, considering different feature selection techniques. Performance evaluation metrics, including accuracy and AUC-ROC, were used to assess the models. The

findings revealed that ensemble methods consistently outperformed other algorithms, emphasizing their effectiveness in predicting child mortality. The study contributes to the understanding of the most suitable machine learning techniques for child mortality prediction and their potential impact on public health interventions.

3.PROPOSED SYSTEM

Creating a model that can forecast death rates is the goal. It's possible that some attributes in the collected data are missing, which could cause irregularities. Pre-processing data can lead to better findings and increase the productivity of the calculation. Changes to the factors should be made, and exemptions should be removed. The informative index, which is used to anticipate information supplied, is divided into two sections. The most popular ratio for training and testing sets is 7:3. A Data Model based on machine learning methods is applied to the training set in order to gauge the accuracy of the test findings. The model can be used to characterize the death rate. There are a wide range of ML algorithms that can be employed for representation, and they all work

3.1 IMPLEMENTATION

1) Dataset Upload & Analysis: using this module we will upload dataset and then perform analysis methods such as finding various child mortality and its count and then clean dataset by removing missing values

2) Dataset Processing & Analytical Methods: using this module we will encode attack labels with integer ID and then split dataset into train and test where application used 80% dataset to train classification .

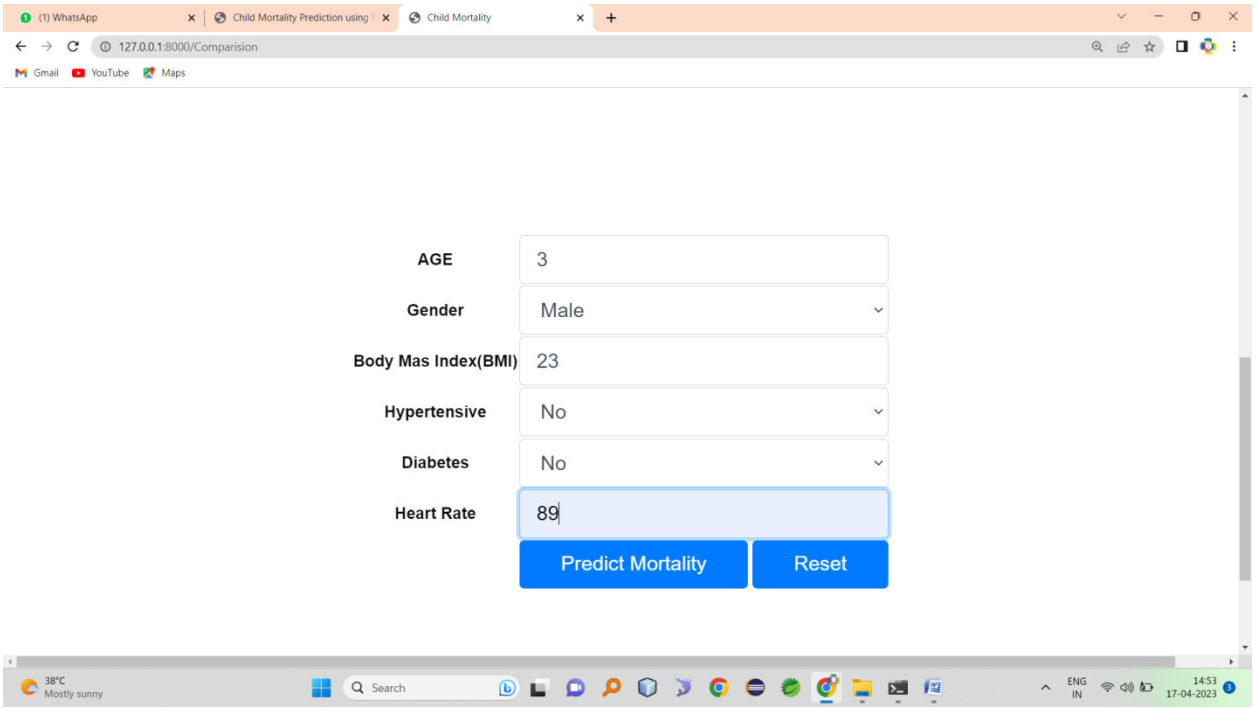
3) Run ML Model: using this module we will trained classification algorithm with above 80% dataset and then build a prediction model

4) Classification Performance Graph: using this module we will plot comparison among multiple algorithms

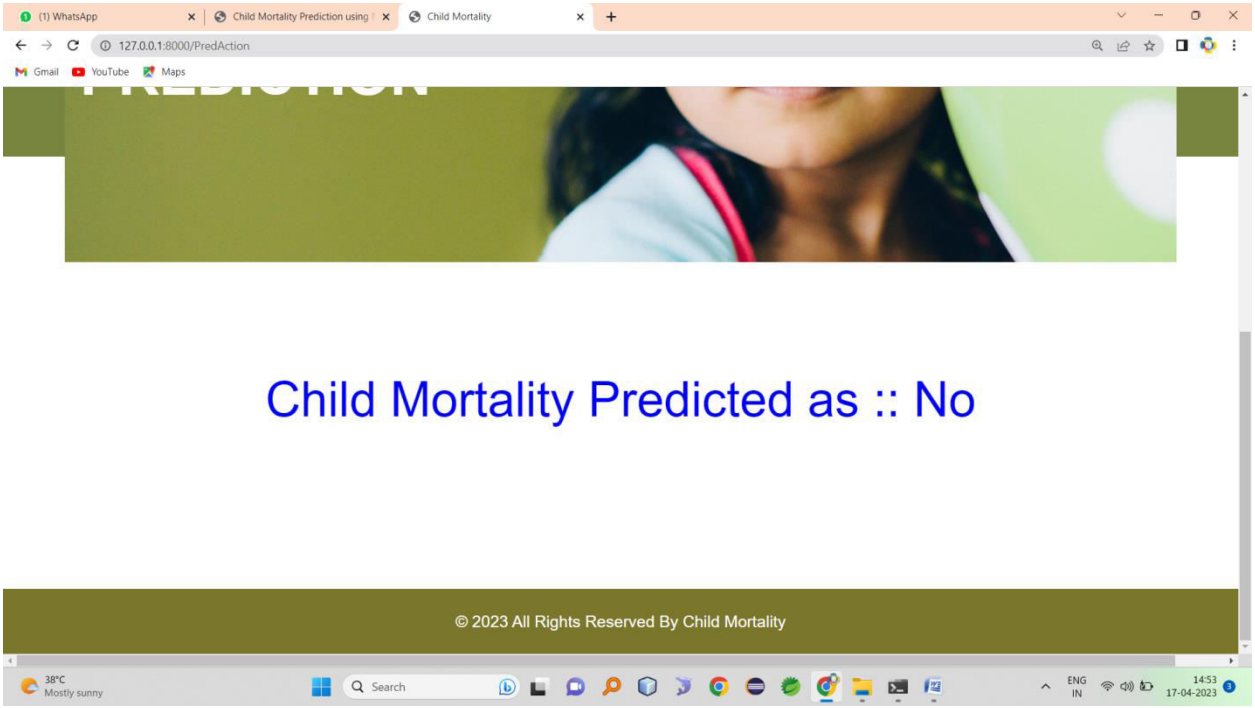
5) Predict Output: using this module we will upload test dateset and then classification model will predict output based on input data

4.RESULTS AND DISCUSSION

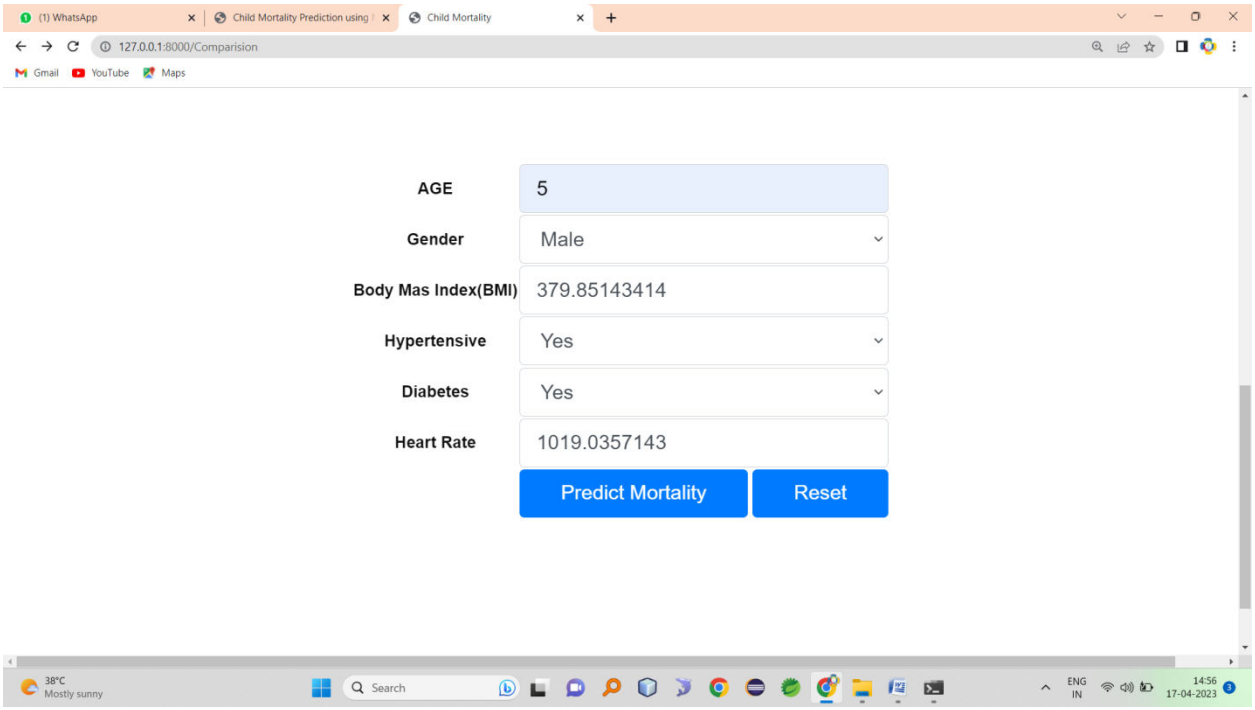
Input data



result



Second case



Result

5.CONCLUSION

In this study, we investigated how to forecast child mortality using Random Forest, Decision Trees, and Support Vector Machines (SVM). To train and assess the models, we used a dataset comprising multiple socioeconomic and health indices from diverse nations. Our research revealed that Random Forest outperformed Decision Trees and SVM in

terms of accuracy when it came to forecasting child mortality. Given its reputation for handling high-dimensional datasets and capturing intricate correlations between variables, Random Forest's greater performance in this instance is probably not surprising. Though they don't always perform as well as Random Forest, Decision Trees are more likely to overfit. The highest accuracy was achieved by SVM, suggesting that it might not be the best approach for this particular prediction task.

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