**DIABETES FORECASTING THROUGH THE LENS OF AI AND ML:**

**PIONEERING INSIGHTS FOR PRECISION HEALTH**

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This abstract encapsulates the utilization of Artificial Intelligence and Machine Learning (AIML) for predicting diabetes, addressing the escalating prevalence of this health concern. By harnessing diverse datasets encompassing medical records, lifestyle factors, and genetic information, various machine learning algorithms, including Support Vector Machines, Decision Trees, Random Forests, and Neural Networks, are deployed to discern patterns and forecast diabetes risk. The model incorporates robust data preprocessing and augmentation techniques to enhance its resilience, while feature engineering and selection methods optimize predictive accuracy. Evaluation metrics such as sensitivity, specificity, and area under the Receiver Operating Characteristic curve underscore the model's efficacy compared to traditional diagnostic approaches. This research signifies a crucial step toward proactive healthcare strategies, offering early intervention and personalized care to combat the global burden of diabetes.

**Keywords:** Support Vector Machines, Decision Trees, Random Forests, and Neural Networks.