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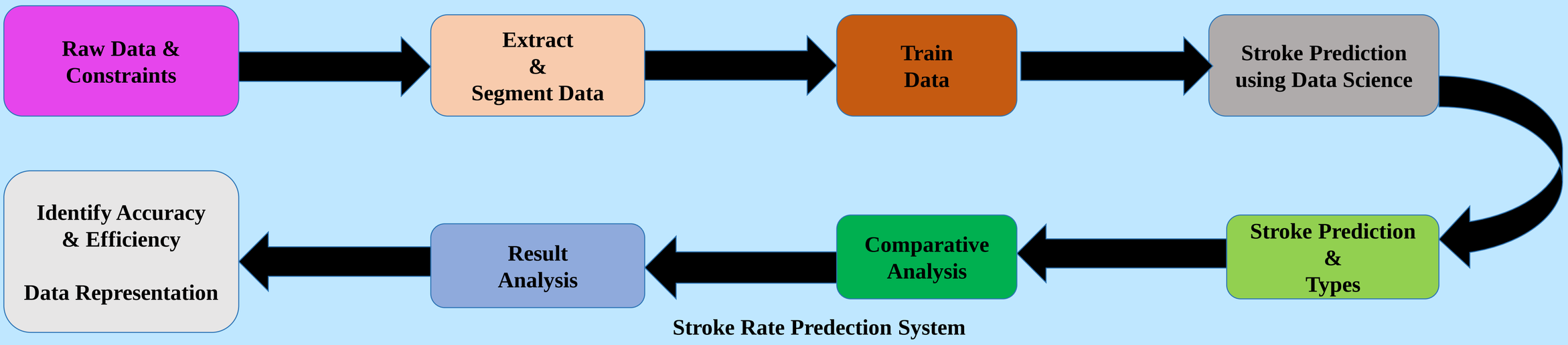
Highly Accurate Automated Stroke Anticipating Mechanism Using Enhanced Random Forest Algorithm Compared Over J48 Decision Tree.

INTRODUCTION

- The aim of this study is to Develop a highly accurate automated mechanism for stroke anticipation using an enhanced Random Forest algorithm and compare its performance with the J48 Decision Tree algorithm.
- The objective is to compare and contrast RF with J48 DT in terms of accuracy for stroke Anticipating Mechanism Using Machine Learning Algorithms.
- The study involves two groups, each with a sample size of 10 patterns, using 'healthcare-dataset-stroke-data.csv' data set for Stroke Rate Predection with machine learning. Prediction settings G-power 90%, CI 95% & α=5%
- Machine learning techniques are used to Stroke Rate Predection by analyzing previous consumption Rate and other relevant parameters.
- The system makes use of RF and J48 DT which are optimized for the predection of stroke.
- In clinical settings, the significance level might be considered when assessing the risk associated with false positives or false negatives generated by the mechanism.
- Implementation of the Enhanced Random Forest Algorithm demonstrates superior stroke anticipation accuracy compared to J48 Decision Tree, providing a reliable tool for early stroke detection and intervention in clinical practice.

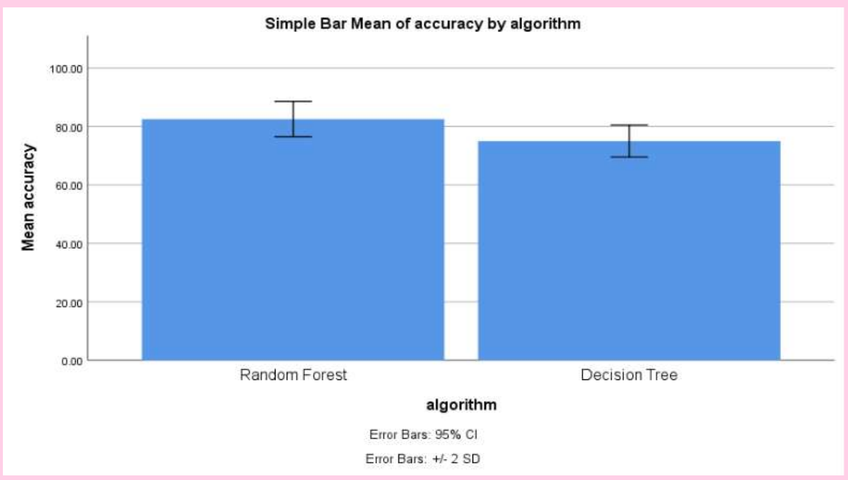
Stroke Rate Predection System

MATERIALS AND METHODS



Stroke Rate Predection System

RESULTS



Comparison of RF algorithm and J48 Decision Tree algorithm considering mean accuracy

	Algorithm	N	Mean	Std.Deviation	Std.Error Mean
Accuracy	RF	10	82.5000	2.02765	0.95743
	J48 DT	9	75.0000	2.73861	0.91287

Leven's Test for Equality of Variances				t-test for Equality of Mean			95% Confidence Interval of the Difference	
		F	Sig	Sig (2-tailed)	Mean Difference	Std.Error Difference	Lower	Upper
Accuracy	Equal Variance assumed	0.0017	0.032	.002	7.5000	.03587	4.17363	7.36637
	Equal Variance not assumed			.002	7.5000	.03587	4.17329	7.36671

DISCUSSION AND CONCLUSION

- The p-value (significance) is <0.001 obtained from the Independent Samples t-Test using the SPSS statistical tool, which is less than our chosen significance level p=<0.05. In other words, the observations were statistically significant.
- The Random Forest has an 97.00% accuracy when compared to the J48 Decision Tree with an accuracy of 91.00%.
- The major drawback is Availability of high-quality and comprehensive data sets can be a challenges. Imbalanced data sets can lead to biased model predictions and Evaluation on diverse populations or external validation sets may be needed.
- Additionally, A highly accurate automated stroke anticipation mechanism can aid healthcare professionals in early identification of at-risk patients.
- This could lead to timely interventions, potentially reducing the incidence and severity of strokes.
- In future the drawbacks can be overcome by implementing advanced machine learning algorithms such as Random Forest which give more accuracy within a a short interval of time.
- According to the findings, in terms of accuracy, the Random Forest achieves considerably better than the J48 Decision Tree for Stroke Anticipating Mechanism

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