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An improved approach for prediction of Parkinson's disease using machine learning techniques

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Abstract

Document Sections

- I. Introduction
- II. Related Research Work
- III. Materials and Methods
- IV. Results and Discussion
- V. Conclusion

Abstract: Parkinson's disease (PD) is one of the major public health problems in the world. It is a well-known fact that around one million people suffer from Parkinson's disease in the United States whereas the number of people suffering from Parkinson's disease worldwide is around 5 millions. Thus, it is important to predict Parkinson's disease in early stages so that early plan for the necessary treatment can be made. People are mostly familiar with the motor symptoms of Parkinson's disease, however an increasing amount of research is being done to predict the Parkinson's disease from non-motor symptoms that precede the motor ones. If early and reliable prediction is possible then a patient can get a proper treatment at the right time. Non-motor symptoms considered are Rapid Eye Movement (REM) sleep Behaviour Disorder (RBD) and olfactory loss. Developing machine learning models that can help us in predicting the disease can play a vital role in early prediction. In this paper we extend a work which used the non-motor features such as RBD and olfactory loss. Along with this the extended work also uses important biomarkers. In this paper we try to model this classifier using different machine learning models that have not been

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V. Conclusion

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extend a work which used the non-motor features such as RBD and olfactory loss. Along with this the extended work also uses important biomarkers. In this paper we try to model this classifier using different machine learning models that have not been used before. We developed automated diagnostic models using Multilayer Perceptron, BayesNet, Random Forest and Boosted Logistic Regression. It has been observed that Boosted Logistic Regression provides the best performance with an impressive accuracy of 97.159 % and the area under the ROC curve was 98.9%. Thus, it is concluded that this models can be used for early prediction of Parkinson's disease.

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I. Introduction
Parkinson's disease (PD) is a chronic, degenerative neurological disorder. The main cause of Parkinson's disease is actually unknown. However, it has been researched that the combination of environmental and genetic factors play an important role in causing PD [1]. For general understanding the Parkinson's disease is a disorder of the central nervous system which is the result of loss of cells from various parts of the brain, specifically the substantia nigra cells that produce dopamine. Dopamine plays a vital role in the coordination of movement. It acts as a chemical messenger for transmitting signals within the brain.

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