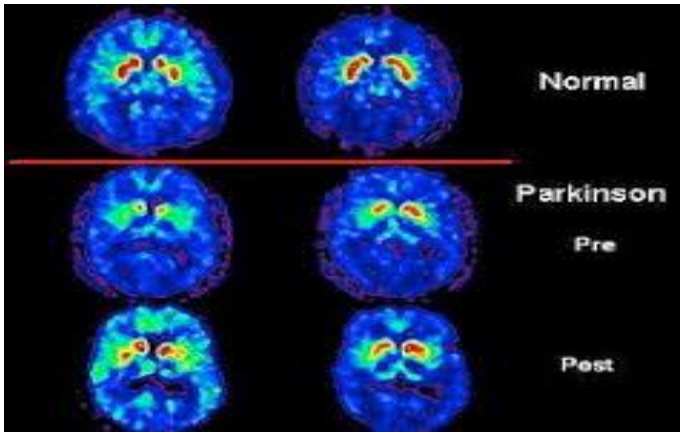

Parkinson's disease - Wikipedia

Automated Parkinson disease prediction using capsuleNet

Parkinson's disease - Wikipedia

Owonikoko olaoluwa daniel
17/7cs/093
Computer science
Project supervisor: Dr miss Babatunde

Parkinson's disease - Wikipedia

Overview

Proposer on automated Parkinson disease and articles about the causes of Parkinson disease possible ways on how to solve and predict the stages with different algorithms.

Goals

1. Summary of 15 articles on parkinson disease.
2. Summary on different algorithms used in predicting Parkinson disease.
3. Possible ways to improve an algorithm to predict Parkinson disease

Parkinson's disease - Wikipedia

Specifications

Parkinson's disease is a progressive nervous system disorder that affects movement. Symptoms start gradually, sometimes starting with a barely noticeable tremor in just one hand. Tremors are common, but the disorder also commonly causes stiffness or slowing of movement.

Although Parkinson's disease can't be cured, I believe with an automated system that can take images of the brain and can predict if the brain may or has Parkinson's will help to prevent or reduce people who are suffering Parkinson in different stages.

Parkinson's disease - Wikipedia

medications might significantly improve your symptoms. Occasionally, doctors may suggest surgery to regulate certain regions of your brain and improve your symptoms.

What is capsuleNet: A **Capsule Neural Network** (**CapsNet**) is a machine learning system that is a type of artificial neural network (ANN) that can be used to better model hierarchical relationships. The approach is an attempt to more closely mimic biological neural organization.[1]

The idea is to add structures called “capsules” to a convolutional neural network (CNN), and to reuse output from several of those capsules to form more stable (with respect to various perturbations) representations for higher capsules.[2] The output is a vector consisting of the

Parkinson's disease - Wikipedia

probability of an observation, and a pose for that observation. This vector is similar to what is done for example when doing *classification with localization* in CNNs.

Among other benefits, capsnets address the "Picasso problem" in image recognition: images that have all the right parts but that are not in the correct spatial relationship (e.g., in a "face", the positions of the mouth and one eye are switched). For image recognition, capsnets exploit the fact that while viewpoint changes have nonlinear effects at the pixel level, they have linear effects at the part/object level.[3] This can be compared to inverting the rendering of an object of multiple parts.

What is Parkinson disease: Parkinson's disease (PD) is a neurodegenerative disorder that affects predominantly dopamine-producing (“dopaminergic”) neurons in a specific area of the brain called substantia nigra.

Parkinson's disease - Wikipedia

Automated Parkinson disease using capsule network: This is a way of using a neural network to make a prediction whether an image uploaded to the algorithm has Parkinson disease or likely to have in the future based on the dataset the algorithm had been trained on.

What is a dataset: A data is facts and statistics collected together for reference or analysis, a dataset is a collection of related data in various forms which include images, video, audio, text etc.

Parkinson dataset can be coagulated by either visiting hospitals or by already done dataset provided platforms such as kaggle.

Parkinson's disease - Wikipedia

Write the model using python language and train the model for possible testing using another dataset to make sure the model works well

Converting the dataset to what an algorithm can find a pattern on, loading the dataset and trim it in case of empty or null columns or rows.

Various article on Parkinson disease prediction using different algorithm

Parkinson's disease - Wikipedia

Machine Learning Approaches for Detecting Parkinson's Disease from EEG Analysis: A Systematic Review	An app was created called Mpower in which persons with Parkinson disease were asked to download on their smartphones to track how they work, talk, move and sleep. The app will keep track of these activities everyday and the data is saved on each user data list which will then be put against machine learning algorithms to predict various stages of the patient's how possibly remedy. reference: Patrick Schwab & Walter Karlen, (2015). Detecting and monitoring the symptoms of Parkinson's disease using smartphones.

Parkinson's disease - Wikipedia

Classification of Parkinson's disease and essential tremor based on balance and gait characteristics from wearable motion sensors via machine learning techniques: a data-driven approach	A motion sensor was developed which is attached to various parts of the body of people with people within the range of age 60-65 and asked them to walk which test their motion and how they stand. After the test their result data is put together and trained with a Random forest machine learning algorithm to detect if the patient has Parkinson disease or likely to have Parkinson disease. reference: Moon, S., Song, HJ., Sharma, V.D. *et al.* Classification of Parkinson's disease and essential tremor based on balance and gait characteristics from wearable motion sensors via machine learning techniques: a data-driven approach. *J NeuroEngineering Rehabil* 17, 125 (2020).

Parkinson's disease - Wikipedia

Classification of Parkinson's Disease Using MRI Data and Deep Learning Convolution Neural Networks	30 people with Parkinson disease were selected with other random people without Parkinson disease in order to take the image of their brains and convert with One-hot-encoder to binary after the image had been smoothen to prevent the algorithm from prediction over fitting. And the converted data is loaded to the CNN algorithm with appropriate properties. A brain image of people with Parkin disease was loaded to test the algorithm perhaps it trained well. The outcome provides 97% accuracy. reference: Saha, Roshni, "Classification of Parkinson's Disease Using MRI Data and Deep Learning Convolution Neural Networks" (2019). Creative Components. 241.

Parkinson's disease - Wikipedia

Automated Detection of Parkinson's Disease Based on Multiple Types of Sustained Phonations Using Linear Discriminant Analysis and Genetically Optimized Neural Network	An hybrid intelligent system for Parkinson disease detection based on multiple types of sustained phonations data. The developed system uses linear discriminant analysis (LDA) model for dimensionality reduction and neural network model for classification. The architecture of the neural network model was optimized using genetic algorithms. Experimental results showed that the developed intelligent system was capable of discriminating between PD patients and healthy subjects with an accuracy of 95% on training databases and 100% on testing databases using all the collected features of the dataset. However, the limitation of gender imbalance in the dataset was highlighted and hence the gender dependent features were eliminated and the proposed system was again simulated. Consequently, we obtained 80% accuracy on the training database and

Parkinson's disease - Wikipedia

	82.14% on testing. The results on both *i.e.* training and testing databases were obtained using one generalized model which also has the benefit of lower complexity. Thus, based on the experimental results, it can be concluded that the proposed automated system has the potential to help physicians improve the quality of decision making during the diagnosis process of Parkinson disease patients. reference: IEEE J Transl Eng Health Med. 2019

Parkinson's disease - Wikipedia

A Comparative Analysis Of Parkinson Disease Prediction Using Machine Learning Approaches	Representing three supervised learning machine learning approaches. A while later, the performance of the three classifiers which are utilized in the prediction of Parkinson disease and assessed their exhibition utilizing diverse statistical methods. The tentative performance demonstrates that the SVM has achieved the highest performance than the other two classifiers within the Parkinson datasets. It is 100%. This analysis has utilized three machine learning methods for the exposure of Parkinson disease in view of a few parameters. In accumulation, this work is part of a project that has the aim to cultivate an automated application to give more accurate action to normal occurrences and make a greater decision to multifaceted situations. The application will be able to detect Parkinson disease in very few minutes and notify the dangerous probability of having the disease. This application can be outstandingly helpful in peoples, where there is a lack of medical institutes and as well as particular physicians. In my experiments, each classification algorithm was prepared and assessed on a training set that includes
Parkinson's disease - Wikipedia	

	both positive and negative samples. Moreover, the work can be supportive of Parkinson disease detection by collecting data from different clinical and medical centers and can provide more accurate results for disease prediction and diagnosis. In my research goal, there are several directions for future work in this area of research. We have only investigated three popular supervised algorithms; it can be preferring more algorithms for developing the precise model of these Parkinson disease prediction and performance can be more improved. In synopsis, our study painted the research objective besides opportunity with respect to Parkinson disease area by machine learning approaches, which has an arising impression in health fields reference: INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH VOLUME 8, ISSUE 11, NOVEMBER 2019

Parkinson's disease - Wikipedia

MACHINE LEARNING BASED APPROACHES FOR PREDICTION OF PARKINSON'S DISEASE	The prediction of Parkinson's disease is the most important and challenging problem for biomedical engineering researchers and doctors. In this paper, minimum redundancy and maximum relevance feature selection algorithms were used to select the most important feature among all the features to predict Parkinson diseases. Here, it was observed that the random forest with 20 number of features selected by minimum redundancy maximum relevance feature selection algorithms provide the overall accuracy 90.3%, precision 90.2%, Mathews correlation coefficient values of 0.73 and ROC values 0.96 which is better in comparison to all other machine learning based approaches such as bagging, boosting, random forest, rotation forest, random subspace, support vector machine, multilayer perceptron, and decision tree based methods. Machine Learning and Applications: An International Journal (MLAIJ) Vol.3, No.2, June 2016

Parkinson's disease - Wikipedia

Identifying of factor associated with parkinson's disease subtypes using random forest Parkinson's disease - Wikipedia	Parkinson's disease (PD) is a neurodegenerative disorder that is caused by the result of lack of dopamine in a specific area of the brain called bangsal ganglia. It is a long term degenerative disorder of the central nervous system that mainly affects the motor system that has some impacts such as difficulty in speech, problem in swallowing, and dressing, trouble with handwriting or even doing some activities, and tremor. Based on this problem, researchers use the Parkinson's Progression Markers Initiative (PPMI) database to Tremor Dominant (TD) and Postural Instability Gait Difficulty (PIGD). Identifying the factors of Parkinson's disease subtypes is crucial in understanding the appropriate therapy for Parkinson's disease patients. Furthermore, it gives some characteristics of patients

	that are classified into TD or PIGD. Classification method is used to identify the factors of Parkinson's disease subtypes on 207 patients with PD and 47 variables obtained from Movement Disorder Society-Unified Parkinson Disease Rating Scale (MDS-UPDRS) part II and part III in event V12. The result is PD patient who is classified to PIGD class have the lowe value in constancy of rest tremor, rest tremore amrplitude (RUE), tremor, rest tremor amplitude (LUE), and postural tremor of right hand than PD patient with TD and the higher value in postural stability, walking and balance, and freezing than PD patient with TD.

Parkinson's disease - Wikipedia

Parkinson's disease - Wikipedia

MY PROPOSER

Parkinson's disease - Wikipedia

Parkinson's disease - Wikipedia