

Deep Learning for Activity Classification of Limb Motion Data

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Abstract

Parkinsons Disease is a neurodegenerative disease which affects the substantia nigra which is part of the motor system of the brain. Approximately 127,000 people in the UK have the disease, with 1 in 100 people over the age of 60 having the disease. Diagnosis and monitoring progression of the disease is currently very time consuming and costly, as the patient has to have a one-on-one consultation with a physician while they conduct a number of tests. As symptoms can be intermittent, these tests may not pick up on the symptoms even though they are present with the individual. Continual recording would alleviate this problem, however currently it is infeasible, as the costs involved in a physician reviewing days, if not weeks, of data is too great. Using machine learning and deep learning techniques to explore this data and find useful diagnostic features would allow physicians to be able to review large quantities of patient data in a reasonable amount of time, thus allowing a much more accurate diagnosis to take place.

In this poster we describe how a Deep Neural Network (DNN) can be used to classify movement types as a proof of concept for their ability to detect and classify movement disorders such as Parkinson Disease. We also show that the DNN can achieve comparable accuracy to state-of-the-art machine learning techniques on our dataset.

Keywords: Deep Learning, Machine Learning, Accelerometer, Parkinson Disease