INTRODUCTION

Parkinson’s Disease is a neurodegenerative disorder. It is usually diagnosed around 60 years of age and at onset typically presents with tremors and cognitive difficulties. It is not presently known what causes the initial damage, but once the Parkinson’s Disease diagnosis is made, it continues until the patient’s death.

An immense amount of research has gone into understanding and treating the disorder. Postmortem studies have discovered neurological damage begins in the substantia nigra and spreads to the basal ganglia. These two areas are known to use the dopamine neurotransmitter to regulate intentional muscle movement. As the damage progresses, the patient eventually loses all ability to control muscular function.

There are pharmacological treatments that can mitigate the symptoms of the disorder. They work by increasing the amount of dopamine available in the system, or increasing the neuronal sensitivity to dopamine. This is far from an exact science and every drug comes with a limited efficacy period as the systems adapt and damage progresses. Any increase in the efficacy period would bring additional relief to hundreds of thousands. In addition, overmedication can and does occur because the time between administering the drug and the resulting effect can take weeks. This brings new dangers as increasing the available dopamine too far results in the patient expressing schizophrenic symptoms.

Because of this, patients are monitored closely and clinicians are trained to take physiological measurements that are used to determine pharmacological treatment schedules. That requires direct contact with the patient and is a significant part of the cost of treating the disorder. A Tsanas, MA Little, PE McSharry, LO Ramig (2009) investigated using deterministic regression analysis of 16 components of speech to attempt to predict the clinician’s assessment. These components include things like forms of jitter and shimmer.

In this paper we use non-deterministic methods to investigate the same problem space. We used two general approaches. On one side we used clustering techniques to discover interesting points to use as training models for machine learning algorithms. On the other, we re-imagined the data as transactions and did pattern analysis.