Alzheimer's Analysis with Deep Learning

Marcia Young Hon

Master of Science 2017

Data Science and Analytics

Ryerson University

ABSTRACT

Alzheimer's is a serious disease characterized by a progressive degeneration of the brain affecting 60 to 80 percent of dementia cases. In this project, I will be using Deep Neural Networks in order to both classify and predict Alzheimer's disease based on MRI and PET images of the brain. The Deep Neural Network will be built with the Python-based machine learning API called TensorFlow created by Google. The dataset consists of MR and PET images collected from "Alzheimer's Disease Neuroimaging Initiative" (http://adni.loni.usc.edu). This is a free dataset and I have requested access.

Keywords:

1. **Alzheimer's:** is a disease of mental deterioration occurring in middle or old age.
2. **Deep Learning:** is machine learning using artificial neural networks with many layers.
3. **Neural Network:** a type of algorithm that tries to replicate how neurons of the brain behave in order to create machine learning and artificial intelligence.
4. **Neuroimaging:** imaging to get structural/functional/pharmacological info of the brain.
5. **MRI (Magnetic Resonance Imaging) and PET (Positron Emission Tomography):** are non-invasive imaging tests to obtain information of physiological processes of the human body.