ABSTRACT

Image analysis is giving a huge breakthrough in every field of science and technology. The image is just a collection of pixels and light intensity. The image capturing was done in two ways: (1) by using infrared sensors and (2) by using radiography. The normal images are captured by using the infrared sensors. Radiography uses the various forms of a light family, such as x-ray, gamma rays, etc., to capture the image. The study of neuroimaging is one of the challenging research topics in the field of biomedical image processing. So, from this note, the motivation for this work is to analyze 3D images to detect Alzheimer’s disease and compare the statistical results of the whole brain image data with standard doctor’s results. The authors also provide a very short implementation for brain slicing and feature extraction using Freesurfer and OpenNeuro dataset.
Analysis of Biomedical Image for Alzheimer’s Disease Detection

INTRODUCTION

The most common neurodegenerative disease is Alzheimer’s (AD). It also goes a major health care issue of the future. During the next four decades, it has been estimated that the occurrence of AD will quadrivial the population of affected people from 27 million to 106 million vide Brookmeyer et al. (2007). According to Koenders et al. (2016), the count of Alzheimer patient has increased to 1 in 85 persons across the world. Any delay in detection and taking preventing step on Alzheimer disease lead to serious damage to brain cells. Intervention at an early stage of Alzheimer disease help in slowing down the process of mental disorder. In the initial stage, mild cognitive impairment (MCI) is found in the patient. It is a heterogeneous syndrome but it is not necessary that all MCI subjects develop into Alzheimer patients.

GENETIC FACTOR BEHIND ALZHEIMER’S DISEASE

Alzheimer’s disease (AD) is a common form of neurodegenerative disease. Individuals who are impacted by this disease are aware of causes of dementia. The clinical characterization of Alzheimer's involves progressive loss of memory deficits in thinking, problem-solving and it has an impact on language abilities. Neuropathologically AD can be characterized as progressive cortical atrophy due to neural loss and characteristic intracellular and extracellular deposits as insoluble tau and amyloid beta proteins vide Cauwenbergh et al. (2015), this is typically the process in which the disease manifests itself. Study of this disease based on genetically classification provides some important insights. Patients can be divided into two groups one is early onset and the other is late onset. For early onset, studies represent that there is a small set of genes that can be responsible for early onset of the disease but early-onset cases are fraction around five to 10 percent of total observed cases of these patients of early onset 2 to 10 percentage first display symptoms their 20s or their 30s. But the late onset of Alzheimer’s tends to manifest itself after the age of 65. Late onset is pretty complex and is multifactorial, which means multiple genes could be involved and contributing to the disease and it has been found there is a pretty strong genetic predisposition. We have seen that about 30 to 48 percent of patients with Alzheimer’s tend to have a first degree relatives that are also affected. So in trying to pinpoint which genetic risk are contributing
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