

BRAINet: Composite Network Modeling of Neurological/Psychiatric Disorders and Application to Alzheimer's Disease

<https://www.neurodegenerationresearch.eu/survey/brainet-composite-network-modeling-of-neurologicalpsychiatric-disorders-and-application-to-alzheimer%c2%92s-disease/>

Principal Investigators

Burak ACAR

Institution

Bogazici University

Contact information of lead PI

Country

Turkey

Title of project or programme

BRAINet: Composite Network Modeling of Neurological/Psychiatric Disorders and Application to Alzheimer's Disease

Source of funding information

TUBITAK

Total sum awarded (Euro)

€ 155,623

Start date of award

01/11/2014

Total duration of award in years

2

Keywords

Research Abstract

The idea that the brain is composed of functional and structural networks and that defects of these networks are either the cause or the result of the majority of neurological/psychiatric diseases, is widely accepted and is supported by studies on different patient groups. The use of fMRI (functional MRI) for studying the functional networks (fNETs), and dMRI (diffusion MRI) for studying the structural networks (sNETs) have increased within the last decade. Despite the

advantages of these modalities, there are open problems in modeling the sNET-fNET interactions and sNET modeling, the latter being primarily due to the probabilistic nature of dMRI. It is envisioned that solutions to these problems will enable early diagnosis of neurological/psychiatric diseases as well as treatment planning and monitoring with objective criteria. The goal project is (a) to propose novel solutions to the aforementioned open problems in sNET modeling, (b) to model sNET-fNET interactions and proposed a cNET (composite network), (c) to assess the impact.usability of these models on the Alzheimer's Disease modeling to facilitate early diagnosis and treatment planning / monitoring. fMRI and dMRI data will be collected from clinically diagnosed patients as well as their close relatives. Their sNET, fNET and cNET network parameters will be used for the development of diagnostic methods. The patients will be monitored for maximum 24 months and rescanned at the end or else fMRI and dMRI data from (clinically similar but) different patients at different stages of AD will be used for the development of interaction models. The clinical studies will be run by Istanbul Universitesi, Istanbul T?p Fakultesi, Neurology Department. The project involves engineering (Electrical-Electronics Engineering), basic sciences (Physics), medicine (Neurology) research groups from 3 universities and German Cancer Research Center (DKFZ, Heidelberg) Medical & Biological Informatics Department.

Further information available at:

Types:

Investments < €500k

Member States:

Turkey

Diseases:

N/A

Years:

2016

Database Categories:

N/A

Database Tags:

N/A