

# Brain image processing with Alpha-Stable distributions. Applications to intensity normalization, segmentation and diagnosis of Parkinsonian syndrome and Alzheimer's disease.

<https://www.neurodegenerationresearch.eu/survey/brain-image-processing-with-alpha-stable-distributions-applications-to-intensity-normalization-segmentation-and-diagnosis-of-parkinsonian-syndrome-and-alzheimers-disease/>

## **Name of Fellow**

**Institution**

**Funder**

European Commission FP7-Seventh Framework Programme

## **Contact information of fellow**

**Country**

EC

## **Title of project/programme**

Brain image processing with Alpha-Stable distributions. Applications to intensity normalization, segmentation and diagnosis of Parkinsonian syndrome and Alzheimer's disease.

## **Source of funding information**

European Commission FP7-Seventh Framework Programme

## **Total sum awarded (Euro)**

€ 223,778

## **Start date of award**

16/07/14

## **Total duration of award in years**

2.8

## **The project/programme is most relevant to:**

Alzheimer's disease & other dementias

## **Keywords**

Neuroimaging | alpha-stable distribution | Brain tomography | Brain image processing | Alzheimer's disease diagnosis | Parkinsonian syndrome diagnosis

### **Research Abstract**

In this project, D. Salas-Gonzalez proposes to develop brain image processing with alpha-stable distributions with applications to intensity normalization, segmentation and diagnosis of Parkinsonian syndrome and Alzheimer's disease. The expected results of this interdisciplinary project will definitely have applications and impact in the European society and its health, which is an objective of the '2020 Vision for the European Research Area'. Specifically, Parkinson's disease and Alzheimer type dementia are a research priority in developed countries, as their population is becoming older and, therefore, there will be more prevalence of these neurodegenerative diseases in the future.

The main goal and overall objective of this project is to attract the attention of neuroimaging experts to the potentialities and wide range of applications of the alpha-stable distribution: a heavy-tailed, non-symmetric distribution with similar desirable properties to the Gaussian density. The Gaussian distribution is used ubiquitously in neuroimaging. For this reason, the alpha-stable density can be potentially used as an alternative to the Gaussian distribution.

In addition, in order to show the wide range of application in neuroimaging of the alpha-stable distribution, four different research objectives are envisaged in this project. They include basic research, strategic research, applied research and transfer of knowledge:

- i) Intensity normalization of FP-CIT Single Photon Emission Computerized Tomography brain images.
- ii) Segmentation of Magnetic Resonance Images (MRI).
- iii) Feature extraction for Parkinsonian syndrome diagnosis.
- iv) Feature extraction for Alzheimer's disease diagnosis.
- v) Software implementation for real applications.

### **Types:**

Fellowships

### **Member States:**

N/A

### **Diseases:**

Alzheimer's disease & other dementias

### **Years:**

2016

### **Database Categories:**

N/A

### **Database Tags:**

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