

JOB TITLE Post doctoral position in processing of diffusion-weighted MRI images: Unveiling structural alterations in the white matter pathways in Stroke patients.

STARTING DATE Application due before September 1st, 2025. Starting date: January 2026

EMPLOYER CEA

DURATION 2 years

LOCATION NeuroSpin, CEA Saclay, Gif-Sur-Yvette, France

SALARY Based on education and experience. Healthcare/childcare benefits included

CONTACT Please send your application to Dr Philippe Ciuciu (philippe.ciuciu@cea.fr) and Prof. Myriam Edjlali-Goujon (myriam.edjlali@aphp.fr) by joining a CV, a motivation letter and two reference letters.

CONTEXT.

Understanding the organization, function, and singularity of the human brain is one of the major challenges of the 21st century. At CEA Saclay, NeuroSpin is a unique research center dedicated to this goal, utilizing unparalleled neuroimaging investigation tools (clinical MRIs operating at magnetic fields of 3, 7, and 11.7 Tesla and magnetoencephalography). In addition to its technological platform, NeuroSpin brings together 4pl joint research units, including the Inria-CEA MIND team (Models and Inference for Neuroimaging Data), which focuses on modeling and machine learning issues for the analysis of functional brain imaging data (fMRI and MEG).

The BrainSync project aims to exploit multimodal neuroimaging and machine learning tools to develop novel interventional strategies for the motor rehabilitation of the upper limb in chronic stroke patients due to their motor disability. This project, co-led by Dr. Philippe Ciuciu, director of the MIND unit, and Prof. Myriam Edjlali-Goujon (MD, PhD), neuroradiologist at Paris University Hospitals, gathers a large consortium including various CEA institutes (Joliot, Leti, List) within different operational divisions (DRF, DRT), academic partners (Université Grenoble-Alpes, Inria), and clinical centers (APHP, CHU Grenoble-Alpes, CHU St Etienne, GHU Paris Neurosciences).

JOB DESCRIPTION

We are looking for a highly motivated postdoctoral researcher to join the BrainSync project and contribute to the clinical trial titled MOTIF-STROKE, conducted at NeuroSpin in collaboration with several clinical centers in Paris and Alps region. The study aims to understand the link between cerebral (cortical and subcortical) lesions and motor disability in 100 stroke patients, focusing on their structural impairment and functional reorganization. This will be achieved through anatomical and functional magnetic resonance imaging at ultra-high field (7T Terra.X system) and diffusion-weighted MRI at 3 Tesla (Cima.X, high-performing gradients for dwMRI). The construction of a multimodal atlas of brain lesions and the reconstructed tractogram of the cortico-spinal bundle along which potential disconnections and quantitative alterations may occur will be key to decipher the links between motor disability and anomalies in the grey and white matter.

Main responsibilities:

- Coordinate and execute dMRI acquisition protocols at 3T for stroke patients that will help establish precise links between lesion localization, structural connectivity disruptions, functional connectivity anomalies and motor deficits.

- Perform data analysis of the structural MRI dataset collected at 3T, including preprocessing of diffusion-weighted MRI datasets, microstructure modeling and global and probabilistic tractography.
- Work as a team with another postdoc who will be responsible of the analysis of the fMRI dataset collected on the same cohort of patients at 7T to contribute to build up an anatomo-functional atlas.
- Collaborate with a multidisciplinary team including neuroscientists, neuroradiologists, clinicians, and data scientists.
- Present findings regularly at consortium meetings, and occasionally at international conferences.
- Publish results in top-tier peer-reviewed journals.

Candidate profile :

- PhD in neuroimaging, neuroscience, medical imaging or machine learning, with prior experience in processing or analyzing diffusion MRI data.
- Proficiency in Python and/or C++ programming and experience in using large scale computing facility.
- Demonstration of a high degree of autonomy, excellent organization, and very good oral and written communication skills in English.
- Motivation to join an interdisciplinary team involving physicians, nurses, MR physicists, researchers from MIND, and to work in a project-oriented mode with other partners in the BrainSync consortium.