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# Offer #2025-08925

# **Research Engineer - Medical image** quality control tools to assess radiationinduced neurotoxicity

Contract type : Fixed-term contract

**Renewable contract :** Yes

Level of qualifications required : Bachelor's degree or equivalent

Fonction : Temporary scientific engineer

Level of experience : Recently graduated

# About the research centre or Inria department

The Centre Inria de l'Université de Grenoble groups together almost 600 people in 22 research teams and 7 research support departments.

Staff is present on three campuses in Grenoble, in close collaboration with other research and higher education institutions (Université Grenoble Alpes, CNRS, CEA, INRAE, ...), but also with key economic players in the area.

The Centre Inria de l'Université Grenoble Alpe is active in the fields of highperformance computing, verification and embedded systems, modeling of the environment at multiple levels, and data science and artificial intelligence. The center is a top-level scientific institute with an extensive network of international collaborations in Europe and the rest of the world.

## Context

Radiotherapy (RT) is one of the most important treatments of primary brain tumors, of which 60% are high grade. However, its potential neurotoxicity on the central nervous system is a highly relevant clinical issue. It is also part of the priority research questions in radiation protection, regarding the identification and the prevention of non-cancer side effects related to the use of ionizing radiation (IR) for therapeutic purposes. Currently, the most frequent and threatening mid to long-term neurotoxic complication of brain RT is cognitive dysfunction related to radiation-induced leukoencephalopathy (RIL). Image-based biomarkers for RIL include diffuse supratentorial white-matter lesions (WML), ventricular dilatation, and brain atrophy (BA). The associated cognitive impairments can dramatically reduce the quality of life for long-term survivors. The neurocognitive status is also an important end-point in clinical trials. However, the underlying physiopathology of radiation-induced neurotoxicity in normal tissues and organs is poorly understood as well as its potential links with the initiation and temporal progression of specific cognitive dysfunctions.

### Assignment

The candidate will work in the context of the ANR project Radio-Aide, which will offer a stimulating research environment gathering experts in Image processing, Neurosciences & Neuroimaging, in Advanced Statistical and Machine Learning methods with a strong collaboration with neuroradiologists and neuro-oncologists.

The successful applicant will be involved in several crucial medical imaging processing steps: data quality control and harmonization of multi-centre datasets.

#### **Main activities**

Based on the multimodal data from an ongoing cohort (n=224; 2/3 are already collected), the main objectives are to develop advanced spatio-temporal models and innovative AI tools for brain MRI data processing to i) generate new knowledge about the underlying neurotoxic mechanisms implied in the initiation and temporal progression of specific cognitive dysfunctions following brain RT and the radioresistance of targeted anatomic and functional structures, accounting for the tumor- response status as essential contextual data and to ii) predict individual cognitive side-effects at early stage after brain RT to set up mitigation measures to preserve the quality of life for survivors.

#### Skills

The applicant should have skills in MR imaging and image analysis. Moreover, Python programming skills is a key prerequisite. The candidate should be fluent in English (and preferably in French which will be the working language), have a good

# **Benefits package**

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

# **General Information**

- **Theme/Domain :** Optimization, machine learning and statistical methods Statistics (Big data) (BAP E)
- Town/city : Montbonnot
- Inria Center : <u>Centre Inria de l'Université Grenoble Alpes</u>
- Starting date : 2025-07-01
- Duration of contract : 6 months
- Deadline to apply : 2025-06-30

## Contacts

- Inria Team : <u>STATIFY</u>
- Recruiter : Forbes Florence / florence.forbes@inria.fr

# **About Inria**

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

#### The keys to success

Candidates are expected to be highly motivated and to work independently with a strong work ethic.

**Warning** : you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

# **Instruction to apply**

#### **Defence Security :**

This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

#### **Recruitment Policy :**

As part of its diversity policy, all Inria positions are accessible to people with disabilities.