

## Data Scientist Research Engineer for Technology Maturation Project: Deep Learning for Patient-Tailored Ablation of Persistent Atrial Fibrillation

The Society for Technology Transfer Acceleration (SATT) Sud-Est aims at transferring innovative research results issued from public laboratories towards the socioeconomic world through the protection and maturation of technologies, as well as the valorization of results via entrepreneurship or the sale of exploitation licenses to innovating companies. The transfer phase consists in further developing the inventions and increasing their reliability so that companies can adopt a technology better adapted to their needs. SATT Sud-Est is at the service of academic establishments of PACA & Corse Regions: universities, CNRS, Inserm, university hospital centers (CHU) of Nice and Marseilles.

### Job Description

Considered as the last great frontier of cardiac electrophysiology, atrial fibrillation is the most common sustained arrhythmia encountered in clinical practice. Catheter ablation of atrial zones considered responsible for maintaining the arrhythmia is becoming the preferred therapy for persistent fibrillation forms due to its good long-term success rate. A new patient-tailored ablation protocol has been shown to outperform classical protocols, but the zones to be ablated are identified visually. To overcome the drawbacks of subjective identification and automatically localize the atrial sites to be treated by ablation, a family of algorithms based on convolutive neural networks for deep learning has recently been developed at the Computer Science, Signals and Systems Laboratory of Sophia Antipolis (I3S, UMR 7271, CNRS, Université Côte d'Azur). Preliminary results on a reduced database have been obtained in a PhD thesis defended in April 2021 and disseminated in several scientific publications showing the interest of the proposed approach.

The objective of the present maturation project is to take the algorithms developed at the I3S Laboratory to a sufficient validation level allowing their inclusion in electrophysiological exploration products that will be placed on the market. To this end, the algorithms must be validated on a larger database and tested on the signals acquired with the new system developed by our industrial partner. In this multidisciplinary project, you will work in close collaboration with other researchers from the I3S Laboratory, cardiologists from Nice Pasteur CHU, and data scientists from the partner company, based abroad.

### Mission description:

- Build a well-documented expanded database: identify new patients, export their clinical and electrophysiological data, harmonize annotations
- Update the classification algorithms using the expanded database
- Document the code of the updated algorithms
- Take part in the installation of the new signal acquisition hardware by the partner company at the electrophysiological exploration laboratory of Nice Pasteur CHU Cardiology Service
- Export and validate the data acquired with the new hardware
- Interact effectively with the different partners (researchers, clinicians, company) to answer questions arising during the maturation project
- Exploit and present data analysis results, guaranteeing their quality and follow-up
- Write scientific reports, publications, patents
- Participate in the dissemination and valorization of results in the form of oral presentations
- Ensure the scientific and technologic watch in the domain of the project.

### Profile Description

The ideal candidate will hold a PhD in an area related to Data Science. Strong knowledge in signal processing and machine learning. Mastering of computer tools for data analysis and deep learning (TensorFlow, Keras, PyTorch, Pandas, SciKit-Learn, MATLAB, ...), with a minimum of 3 years of experience and an excellent level software development. Experience with the management and analysis of biomedical databases. Knowledge of cardiac electrophysiology desirable. Good oral and written English communication skills.

Experience in the post: Minimum 3 years  
Duration: 12-month contract (CDD)  
Position status: Executive  
Syntec (IT) national collective agreement

Working time: Full time  
Monthly gross salary: 2500-2800€  
Envisaged starting date: October 01, 2021  
As soon as possible - before end 2021

Please send your application (updated CV, motivation letter, recommendation letters and any other document attesting your skills) to the following e-mail addresses:

[recrutement@sattse.com](mailto:recrutement@sattse.com), [vicente.zarzoso@univ-cotedazur.fr](mailto:vicente.zarzoso@univ-cotedazur.fr)