Position of Development and/or Research Engineer in Computer Science

Where: Hubert Curien Laboratory, Université Jean-Monnet, Saint-Etienne, France – partly remote work can be discussed

Contract duration: 20 months with possibilities of continuation

Desired start: September 2021

Salary: according to CV, ministerial grid for Higher Education and Research

Contact: by mail at first, Dr. Rémi Eyraud (Remi.Eyraud@univ-st-etienne.fr)

Context

The Artificial Intelligence for Onco-Plasma project brings together researchers in **Machine Learning** from two CNRS laboratories (Laboratoire Hubert Curien in Saint-Etienne, Laboratoire d'Informatique et Systèmes in Marseille) and researchers in **Biophysics** (Faculty of Pharmacy of Timone, Institute of Neurophysiopathology in Marseille).

This 3-year funding, obtained within the framework of the French Ten-Year Cancer Control Strategy and piloted by INSERM, aims to promote recent and multidisciplinary research work.

Our team has recently demonstrated that it is possible to **automatically distinguish between cancer patients**[1] and healthy people from a simple blood sample, with a reliability of more than 90%. Our method is based on the use of a biophysical instrument allowing the denaturation of blood plasma whose outputs are directly processed by machine learning algorithms.

The potential of these results is very important: each instrument, of a modest cost, allowing to treat up to 48 samples in 2 hours, it is reasonable to imagine to have in the short term a **non-invasive device for the detection of cancers,** which will have a strong impact on public health.

The scientific proof of concept having been brought, we are starting the **prototyping phase** of the final tool while continuing the research to improve the approach.

The context of this position is therefore particularly exciting, both on the societal and intellectual sides: its purpose and its proximity to research at the cutting edge of current knowledge constitute a unique environment. The presence of professors in the team will also allow a **high quality continuous training** of the recruited person (in particular in machine learning).

The **creation in the medium term of a company** to valorize this work is a probable perspective.

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1 See the scientific article *An AI-Powered Blood Test to Detect Cancer Using NanoDSF,* Tsvetkov et al, **Cancers**, 13(6), https://www.mdpi.com/2072-6694/13/6/1294, 2021

Missions

The initial goal of this contract is to **develop the software architecture** of the project. The person recruited will primarily develop a prototype allowing to:

- Normalize the output signal
- Store it in a centralized **database** to be created
- Process this signal via machine learning algorithms

This prototype will provide a simple, robust, and intuitive **web interface** to manage the data and algorithms, but also to be used by medical staff as a diagnostic aid.

The scientific context of the position allows an important opening towards research: the person recruited will be encouraged to participate in **future research developments** on this issue.

Profile

Master's degree or an engineering degree in computer science with good software development skills (front & back ends).

Python, SQL, javascript programming

Data Science and/or Machine Learning skills appreciated.