

Engineer/Postdoctoral Researcher

ENTREPRISE

PULSALYS, accelerator and technology transfer office of Lyon and Saint-Etienne, builds the innovative products and services of tomorrow, transforming scientific discoveries from the laboratories of Université de Lyon into economic opportunities for companies and startups.

Created in Lyon in 2021, XmBauble is a French startup that develops the XmART application, based on the Tezos blockchain and a surface analysing algorithm. The app allows you to generate an NFT from the coordinates to mapping points of the art object surface – using a smartphone. This operation links art objects with their unique digital identities: the NFT is the infallible and immutable «biometric» identity card, guaranteeing its authentication and the traceability of its origin.

The Physics Laboratory of Ecole Normale Supérieure de Lyon (LPENSL) covers various fields, from statistical physics to hydrodynamic turbulence, including mathematical physics and signal processing, but also soft or condensed matter. The diversity of topics studied allows the laboratory to tackle old problems or emerging ones combining modelling and experiments at the highest level. Internal ability in the laboratory can rely on a ground of exact results, on advanced numerical approaches, and on experiments that keep inventing new tools. More specifically, the "Signals, Systems and Physics" team (SISYPHE) conducts work in signal and image statistical processing, graph theory and optimization, these include scale invariance analysis and modelling and finding applications in the fields of physics, biomedical, communication networks and art.

PROJECT

To significantly limit the transaction risk of counterfeit art objects, XmART develops a technology to identify and trace the circulation history of an artwork.

The innovation is based on the alliance of the blockchain and a characterization algorithm, allowing to obtain a «biometric» identity card and to free itself from the IoT relays.

Within the partnership between XmBauble and the Physics Laboratory of Ecole Normale Supérieure de Lyon, PULSALYS supports an R&D program aimed at developing the technology for characterization and digital certification of physical objects and artworks, based on the work in applied mathematics and signal processing conducted in the laboratory.

In this context, PULSALYS recruits Engineer/Postdoctoral fellow in statistical processing of signal and image to perfect, develop, experiment, and confirm authentication algorithms, based on the work of the laboratory, for integration into the XmART application.

MISSIONS

Integrated within the laboratory team and in constant coordination with our project manager, you are the operational relay between XmBauble and laboratory teams. Your missions include:

- Produce a scientific and technical state of the art on theoretical and algorithmic models of signal processing applied to the object's characterization.
- Contribute to design a methodological framework for algorithmic development applied to XmBauble databases and their proof of concept.
- Participate in collecting the database needed for the project, execute tests, and produce metadata for analysis and objects characterization.
- Actively take part in the development, experimentation, proof of concept and integration of algorithms throughout the project.
- Organize regular progress points between laboratory and XmBauble teams and contribute to related reports.
- Contribute to drafting scientific papers.

PROFILE

With a PhD in applied mathematics or signal and image processing, in connection with scale invariance analysis and the development of signal processing algorithms, you are attracted to rigorous experimental approaches involving both research work and experimentation work on real data.

You have a first experience in the field of automatic recognition and objects characterization and, signal processing, and computer development.

Ideally:

- you have programming experience on Matlab, Python and C.
- you have worked in scientific research teams in data engineering or software engineering.
- you have been involved in projects integrating the implementation of innovative algorithm.

You like innovation and entrepreneurship and show intellectual curiosity for advanced technological fields.

You know how to manage a development project with external partners; you demonstrate a strong ability to adapt to a multi-stakeholder approach and know how to manage your projects independently.

TO APPLY

To apply: <https://www.pulsalys.fr/offre-demploi>