Job offer (full time, permanent contract) : Research Engineer in Modeling and Data Inversion for Non Destructive Testing, H/F

Context

WAINVAM-E develops metrology and non-destructive testing solutions based on the use of magnetometers exploiting the manipulation of the electron spin of the nitrogen-vacancy color centers in diamond. The objective of the proposed research work is to make the best use of the data from these sensors by modeling the signals expected in the various applications, and by proposing inversion methods optimizing the quality of image recognition and the design of the sensors.

Part of the work will focus on the research of inversion algorithms for linear multi-input-multi-output (MIMO) systems for the optimal recovery of the underlying information from vectorial magnetic field measurements from sensors. Another part is related to the modeling of the direct problem linking the source (e.g. an electric current distribution in a microcircuit) to the magnetic field. This involves the development of Bayesian inference methods for the estimation of the parameters of these models which are often non-linear. A third part will consist of the use of machine learning tools for the analysis and classification of signals and images in various fields on which the company is working (non-destructive testing, metrology in cell biology).

This research work will be carried out in close collaboration with the company's experimental laboratory where the sensors are developed. The selected inversion solutions will be implemented on real-time electronic systems.

Required profile

PhD with a specialization in applied mathematics, inverse problems in imaging, signal and image processing, machine learning, with a strong taste for applications and physics. Skills in programming languages are essential (Python, C, Java, ...). Knowledge of quantum mechanics and instrumentation skills are a plus.

Necessary skills:

- Ability to understand complex problems and propose innovative solutions;
- Ability to work in a multidisciplinary team, to write clear reports and to explain your work in accessible terms;
- Initiative, curiosity, creativity and dynamism;
- Fluent English (writing reports, projects, presentations, organizing meetings, ...).

Missions and responsibilities

- Development and implementation in Python and C of regularized inversion algorithms for inverse problems, Bayesian inference and experiment optimization ;

- Use of multi-physics simulation tools (such as Scilab, Simulink, Comsol, etc.) to simulate different measurement systems;
- Development and implementation of Computer Vision and Machine Learning methods in Python and Java using advanced tools (Tensorflow, Keras, Torch, ...) for analysis and classification of signals acquired during physical experimentation and images obtained by various imaging processes, including magnetometry;
- Effective implementation on GPU of some of these algorithms and/or interfacing with the team implementing real-time solutions in measurement systems;
- Encouraging exchanges in all of WAINVAM-E's research and development activities: strengthening academic collaborations, participating in international conferences and participating in the drafting of publications and patents.

Conditions

Full-time contract, CDI, under French law.
Location: Ploemeur (56), Brittany, France.
Benefits: WAINVAM-E offers competitive salaries based on experience to encourage motivated and creative people to contribute to its success. As an employee, you have the opportunity to become a shareholder of the company.
Desired start date: January 1, 2021.

Applications

Send your CV with a description of your achievements to : careers@wainvam-e.com