R&D ENGINEER POSITION

Title

Full Stack Engineer in Web Development (Angular/Python) for the OpenCEMS Industrial Chair

Period

April 1st 2024 - August 31st 2025

Project Abstract

Connected environments are typically defined as physical real world infrastructures hosting sensor networks that record phenomena from the real world. The aforementioned sensors provide huge amounts of data that could be useful for various high-level applications (e.g., event detection, forecasting, statistics, energy management). In this project, we take a particular interest in forecasting applications since they allow connected environment users to proactively manage their environments. Predictions allow knowing future states of the environments in advance in order to provide useful insights and knowledge for decision making processes. The OpenCEMS platform provides data management services that cover pre-processing, advanced analytics, and visualization. The main purpose of this project is to add to the OpenCEMS service pack generic and configurable forecasting services that consider prediction specifics (e.g., feature engineering, algorithm optimal tuning, data analysis, precision evaluation, performance evaluation). Finally, in order to cope with the huge amounts of sensor observations the forecasting service needs to be Big Data compatible.

Keywords: Big Data, Supervised Learning, Forecasting, Sensor Networks

Funding: E2S UPPA project from the university of “Pau et des Pays de l’Adour” UPPA

Working Conditions:

- Hosting laboratory: LIUPPA
- Location : Pavillon- 2 Allée du Parc de Montaury 64600 Anglet
- Laboratory expertise: Computer Science

Project Director: Richard Chbeir

Starting Date: January 1st 2024

Duration: 17 months

Salary: 2000 € / month

Mission - Main Activities :

The engineer's role is central in ensuring the proper functioning of the OpenCEMS platform, optimizing its services, introducing new features, and delivering an exceptional user experience. The engineer's role encompasses the following key tasks:

- **Semantic Description of OpenCEMS Services:** The engineer will be responsible for describing the services of the OpenCEMS platform using an existing ontology. This critical step aims to standardize and make services interoperable, thus facilitating their understanding and use by users.
- **Integration of External Services:** There might be a need to integrate external services into the OpenCEMS platform. The engineer will study and implement these integrations, ensuring a smooth and reliable integration process.
- **Creation of an Intelligent Service Composer**: The engineer will be tasked with designing an intelligent service composer based on a recommendation system. This composer will automatically select relevant services based on user needs, thereby enhancing the efficiency of the OpenCEMS platform.
- **Textual Data Analysis for Insight Extraction:** The engineer will incorporate Text Mining and Natural Language Processing (NLP) techniques to analyze textual data. This involves extracting relevant information from unstructured text sources, which can complement sensor data analysis, enriching the platform's forecasting and predictive analytics capabilities.
- **Semantic Analysis and Information Retrieval:** Implementing semantic analysis and information retrieval methods to understand and process textual data. This will enable the platform to offer more nuanced insights and predictions based on textual content analysis.

In addition to the main missions, the engineer may also be involved in other activities related to the project. These include:

- **Performance Optimization:** The engineer will work on optimizing the platform's performance, ensuring that services run efficiently and responsively, thereby guaranteeing an optimal user experience.
- **User Interface Enhancement:** The engineer may contribute to improving the user interface of the OpenCEMS platform, making it more user-friendly and providing a more intuitive user experience.
- Development of Additional Modules: Depending on project requirements, the engineer may be required to develop additional modules to enrich the platform's functionalities.
- **Proposal of New Prediction Algorithms**: The engineer's mission involves proposing new prediction algorithms for data analysis within the OpenCEMS platform. These algorithms are designed to improve the accuracy of predictions, contributing to better management of connected environments.

Applicant‘s Profile:

- The ideal candidate has an engineering degree (if not a master’s degree) in computer science.
- Advanced skills in Text Mining and NLP.
- Experience in implementing machine learning algorithms.
- We expect outstanding analytical competence, experience in software engineering (strong programming skills in Pytho and Angular), as well as superior organization and communication skills.
- The candidate must have a good English level and the capacity to work autonomously.
- Interest in developing and promoting open source developments.
- Passion and motivation towards green initiatives in connected environments.

Application - Evaluation criteria:

- Application file assessment: Selection committee
- Candidates will first be selected based on their application file.
- Those selected after this first step, will then be interviewed.
- Application files will be evaluated based on the following criteria:
    - Grades and ranking during your Master degree, steadiness in your academic background
    - English language proficiency
    - Candidate's ability to present her/his work and results
- Work experience similar to an internship in a laboratory – or likewise
- Application will include: (in a single pdf file)
    - CV
    - Cover letter
    - Master degree grade transcripts and ranking
    - Reference letter (if possible)
    - Contact details of at least two people, from you work environment, who can be contacted for further reference (if possible)

Application must be send to the following email address with the title "R&D Engineer Application": richard.chbeir@univ-pau.fr, salma.sassi@univ-pau.fr

Application Deadline : February 29th 2024

30/01/2024