Master's Internship – Mobile Monitoring Application

I. Mission and Program Plan

Title
Development of a Mobile Monitoring Application

Internship Description

This internship is closely related to the use of the OpenCEMS platform (Open Solution for Easy Data Management in Connected Environments) [1]. OpenCEMS is a platform designed for data management and analysis in various domains, with a specific focus on connected environments and the analysis of their data, whether they come from real sources or simulations.

The primary goal of this Master's internship project is to develop a user-friendly mobile monitoring application tailored to the OpenCEMS platform. This application will offer real-time insights into a set of services available within OpenCEMS solution, empowering users with the ability to conveniently monitor and interact with these services. Through the mobile app, users will have access to the following features:

- **Live Data Streams**: Live data streams will be accessible within the mobile app, allowing users to view real-time data on their mobile devices. This includes visualizations of sensed data, prediction results, and environmental metrics.
- **Historical Data Access***:* Users can access historical data trends and insights conveniently on their mobile devices. This feature enables users to review past performance, compare data, and make well-informed decisions based on historical patterns.
- **Geospatial Visualization**: The mobile app will integrate geospatial mapping functionality, enabling users to monitor connected environments through an interactive map interface. Users can explore sensor locations, anomalies, and environmental conditions, all displayed on a geographic map.
- **Offline Data Sync**: To address connectivity challenges, the mobile app will feature offline data synchronization. Users will be able to access previously loaded data and receive updates as soon as they regain internet connectivity.
- **Customizable Mobile Dashboard**: Users can create their personalized mobile dashboards by selecting and arranging specific services and data components they wish to monitor. These dashboards can include widgets, charts, and graphs that display real-time information about connected environments, predictions, and anomalies.
- **Push Notifications**: The app will incorporate a notification system that delivers timely alerts and updates directly to users' mobile devices. These notifications will inform users about significant events or anomalies occurring within the connected environment. Users will have the flexibility to configure their preferred types of alerts.

By integrating these features into the mobile monitoring application, users will stay seamlessly connected, make informed decisions, and respond promptly to changes in connected environments, irrespective of whether they are using the web interface. This project aims to enhance user engagement and decision-making capabilities through a user-friendly and feature-rich mobile app.

Mission - Main Activities

The student will be responsible for the following tasks during the internship:

1. **Understanding the OpenCEMS platform**
   - Understand the platform features.
   - Gain an in-depth understanding of the prediction, anomaly detection, and real-time data visualization services offered by OpenCEMS.

2. **Mobile Application Development**
   - Design and develop a user-friendly mobile application.
   - Implement real-time data integration module to store sensed data from the mobile device into OpenCEMS.

3. **Real-Time Data Visualization**
   - Develop basic data visualization components (exploration, analysis, prediction) within the mobile app.
   - Ensure real-time updates and data synchronization between the app and OpenCEMS.

4. **User Engagement and Interaction**
   - Allow users to configure monitoring preferences and customize their data views.
   - Implement notifications and alerts for anomaly detection or significant events.

5. **Testing and Optimization**
   - Test the mobile application for usability, performance, and reliability.
   - Optimize the app for responsiveness and real-time data handling.
   - Debug and resolve any issues or bugs identified during testing.

This internship offers an excellent opportunity to gain hands-on experience in mobile application development, data integration, and real-time data visualization. The developed application will contribute to enhancing the usability and accessibility of OpenCEMS services for users in connected environments.

II. Application Requirements and Criteria

Applicant's Profile
- Solid expertise in mobile app development for Android and/or iOS platforms.
- Demonstrated ability to design user-friendly and intuitive mobile interfaces, adhering to industry best practices.
- Solid understanding of real-time data integration and data visualization on mobile devices.
- Excellent organizational and communication skills.
- Proficiency in English with the ability to work independently.
- Passion for developing and advocating for open-source projects.

Allowance
- Approximately 600 euros per month

Working Conditions
- Hosting laboratory: LIUPPA
- Location : Pavillon Montaury, Allée du Parc de Montaury, 64600 Anglet, France
- Laboratory expertise: Computer Science

Starting Date
February or March 2024

Duration:
Between 4 and 6 months

Application

The application should be submitted as a single PDF file and include the following:
- Curriculum Vitae (CV)
- Cover letter
- Transcript of master's degree grades and ranking
- Letter of recommendation (if available)
- Contact information for at least two professional references (if available)

Application must be sent to the following emails with the title "OpenCEMS-Master's Internship Application": richard.chbeir@univ-pau.fr and salma.sassi@univ-pau.fr.

Application Deadline:
January 20, 2024

References

1. Chbeir, R. et al. (2022). OpenCEMS: An Open Solution for Easy Data Management in Connected Environments. In: Hameurlain, A., Tjoa, A.M. (eds) Transactions on Large-Scale Data- and Knowledge-Centered Systems LII. Lecture Notes in Computer Science(), vol 13470. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-66146-8_2