

Developing monitoring solution for healthcare stakeholders

Context

Obstructive Sleep Apnea (OSA) is a sleep pathology that leads to different illness. The goal therapy for OSA is a Continuous Positive Airway Pressure (CPAP). However, CPAP therapy is one of the therapies which has the lowest adherence level. There is an oncoming research project to tackle this low compliance to CPAP. The project is in a close relationship with Linde Homecare France. Linde Homecare France is specialized in patient's following-up with different chronic pathologies. This proposal is made in the context of r-health supported by connected devices and a new clinical approach for patients.

The project has a completely data-driven approach and exploits the value of big data (supplied by Linde Homecare France) to understand compliance in CPAP therapy and define different patient profiles (clusters). With the definition of the different patient profiles, personalized services can be provided to the patient itself but also health caretakers. There is already a thesis that works on these different aspects and there are first glimpses of the services intended for the healthcare stakeholders.

Research lab presentation

DISP-lab (Decision & Information Systems for Production systems, EA4570), gathers researchers from the "Université de Lyon" around a double expertise in Industrial Engineering and Enterprise Information Systems.

The university Lumière Lyon 2 team of the DISP lab brings to this project specific competences in:

- IoT and IoS
- Data analytics
- Service lifecycle management with dedicated efforts in service design, development, implementation, deployment and performance assessment (quantitative and qualitative)
- Business process modelling and optimization
- Risk and total quality management
- Software engineering

Required profile

The selected candidate must be an end-of-study student enrolled in computer science master or engineering programs. The candidate should have a strong programming background with some relevant projects (school projects accepted) in web development/app development, etc.

Topic description

Your work will consist of:

- Developing monitoring system for healthcare stakeholders
- Developing user friendly interfaces that uses predictive model
- Building a coherent database scheme based on the needs (KPIs)
- Database management
- Integrating data from multiple sources in a single database
- Developing a secured HTTP Rest or GraphQL APIs

Suggested work program

	Task	Objectives	Outcomes
2 weeks	Get familiarise with the framework and the dev environment	Acquires skills to start developing on the in-place web application	Be completely comfortable with different dev tools
2 weeks	Develop a web component that would retrieve data from the server	Get in touch with the whole environment (front-end, back-end, databases)	Presentation of the first web components and deployment in production
16 weeks	Developing different user-friendly interfaces that would consume pre-defined predictive model	Take into consideration the needs and develop user-interfaces according to these needs.	Scheduled deployment of the different implementations in production with regular PowerPoint presentations.
3 weeks	Writing of the manuscript	Manuscript written according to the master program requirements	
1 week	Prepare presentation for internship defense	Summarise the internship for easy communication	

Required skills

- Experience with object-oriented programming (preferably Python)
- Familiar with web-frameworks preferably Django or Flask
- Familiar in Front-End Frameworks, preferably React
- Familiar with Git
- Familiar in working with relational databases

Terms

- Ideally this 6-month internship should start by the beginning of February
- The internship grant will be 577,50€
- Accommodation costs in university residence hall will be paid by the university

Application

For application in this internship, applicants are invited to communicate:

- An updated CV
- A motivation letter with explicit interest in this internship
- Marks obtained during the last 3 years.
- Any of your project related to programming (preferably a GitHub link)

For applications and further request of information, please contact:

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