

DESIGN AND IMPLEMENTATION OF A GENERIC FORECASTING SERVICE FOR THE OPENREMOTE OPEN SOURCE IOT PLATFORM

PROJECT INTRODUCTION

OpenRemote is a Dutch/US based company, developing the only 100% open source IoT platform. The platform allows OEMs or Integrators to connect any of their products or devices via the available protocols. Via a generic asset and attribute structure any asset type can be created in the platform to act as a digital twin of the real world. Several types of rules engines allow for visual programming while OpenRemote's own web component library allows front end developers to build application spec mobile or desktop apps.

OpenRemote is used in a wide range of applications, from energy management and light control, to border control and agriculture.



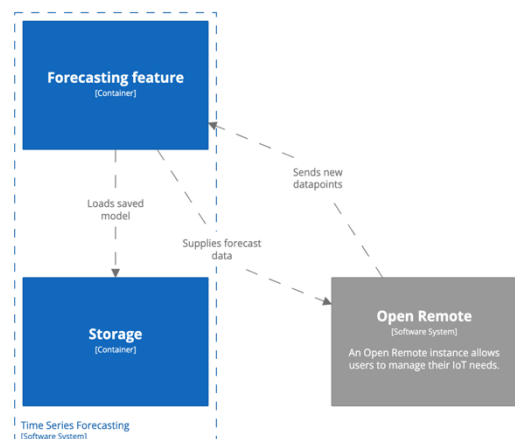
Many applications do require time series forecasting of attribute values. Just two examples are: the forecasting of occupancy of parking spaces to predict potential traffic problems or predict power consumption by public chargers to foresee future bottle necks in the power grid.

Within Saxion, the research groups of Ambient Intelligence (AMI) and Sustainable Energy Systems (SES) are exploring the use of OpenRemote for a wider range of IoT applications, including energy management, benefitting the fully open-source character, while potentially contributing back new generic or energy domain specific features.

STUDENT TASKS

The assignment will include but is not limited to:

- Designing and developing up the service containers for running as well as training several forecasting models, and design datapoint interfaces (APIs) to interconnect the services.
- Conduct user research on typical use cases for the forecasting services.
- Design a forecasting service for forecasting timeseries based examples.
- Prototype the forecasting service iteratively by testing with the target users and employing their feedback to improve the design.



The student will be supervised by a researcher from the Ambient Intelligence research group and the product owner and lead architect of OpenRemote.

PRACTICAL INFORMATION

Student profile: HBO-ICT, ACS student with an affinity for infrastructure design, Java programming experience and a proactive attitude capable of independent work; knowledge and experience in using and contributing to open source; experience with AI/ML tools (LSTM, Arima, Weighted exponential averaging, etc.); experience working with an Agile/Kanban methodology.

Available: OpenRemote software is available at GitHub including wiki documentation. Moreover, an initial feasibility study is available outlining a possible architecture of a generic forecasting service, including PoC software code and documentation. A Student will have ample opportunity to discuss detailed requirements, analysis and possible design directions with OpenRemote's lead architect.

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