

SPARRA – Scottish Patients At Risk of Re-admission or Admission

Background

SPARRA is a Public Health Scotland system that provides risk predictions for most of the Scottish population.

The SPARRA system extracts a patient's hospitalisation and prescribing data from our Corporate Data Warehouse and uses this to predict how likely they are to be admitted to hospital in the next twelve months. This information is available to GPs who may use it to inform care strategies.


SPARRA version 3 has been in use since 2012 and uses a **logistic regression** model, deployed by the Business Intelligence (BI) team at NSS DaS.

Every month, data pipelines built by the BI team in the SAP Data Services platform automatically compute SPARRA risk scores for around 4 million Scottish individuals. These scores are stored within our Corporate Data Warehouse where they can be consumed by various end user applications.

SPARRA version 4






In collaboration with the Alan Turing Institute, Public Health Scotland have developed a new version of the SPARRA system that makes use of modern **Machine Learning** techniques (e.g. topic modelling, boosted decision trees, and neural networks).

The BI team have been working with Public Health Scotland and the Alan Turing Institute to:

1. Train the new SPARRA system (SPARRAv4) within our secure Microsoft Azure cloud environment. 
2. Build a deployment pipeline that combines SAP Data Services with a Machine Learning stack to automatically compute the v4 risk scores.
3. Collaborate on an externally-funded project on assessing the **fairness** of the SPARRA models.

Technology Stack

Our solution for deploying a modern Machine Learning system makes use of a wide range of technologies:

1. Machine Learning code written in the R programming language, 
2. Containerisation through Docker, 
3. Input data processing with SAP Data Services, 
4. Data virtualisation with Denodo, 
5. Container orchestration with Kubernetes. 

The BI team is responsible for the design, build, and deployment of this system, as well as assisting Public Health Scotland with Machine Learning expertise.



Work with us

For further information or to arrange an informal discussion about your place in our team:

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