IADES: Immune-inspired Anomaly Detection in Environmental Sensor Data with Natural Language Generation Support

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Industrial Partners: Weather2 Ltd (Ian Davy), Data2Text Ltd (Yaji Sripada)

Background

- Damage from river flooding is estimated to cost Britain around **£475 million** per annum.
- Existing models are (highly) sophisticated, inconsistent, and need domain knowledge.
- **Data-driven** approach to analysing high resolution Big Weather Data.

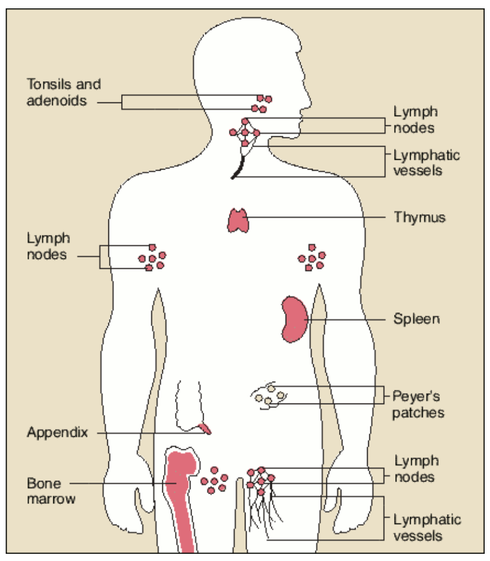
About the Project

- A six month project to develop a proof-of-concept anomaly detection algorithm inspired from human immune system.
- Engaging our industrial partners (Weather2, Data2Text) for further research
- Similar to the immune system protecting us from anomalous invaders, the algorithm continuously monitors environmental data collected from sensors and sends out warning messages if something goes wrong (e.g. potential flood).

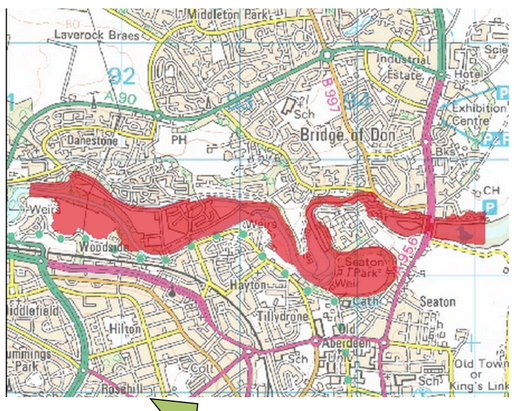
Data

SEPA (Scottish Environment Protection Agency) deployed nearly 400 Gauging Stations to monitor river levels in Scotland.

A SEPA Gauging Station



Inspired

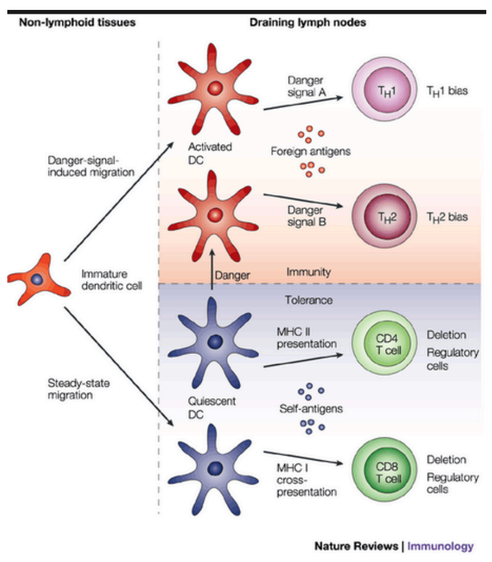


Source: SEPA

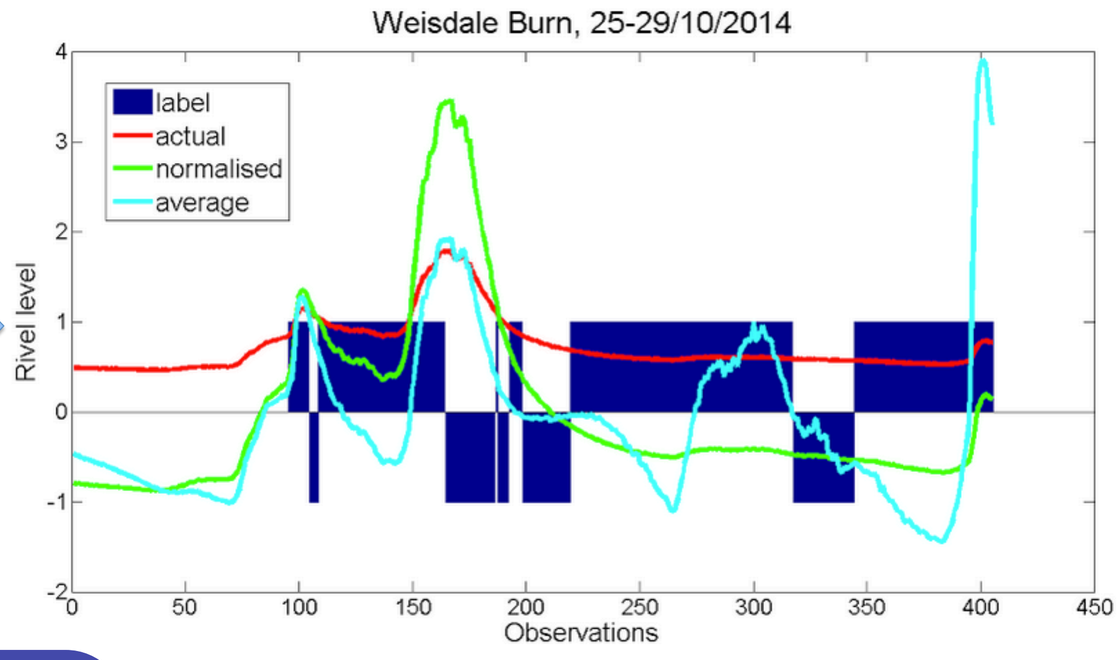
Monitor River Levels

Immune-inspired Monitoring System

Inspired



Label Anomalous Patterns



Impact

- Awarded Member of Contributor Program from Digital Catapult (€10,000 per annum)
- Acquired High Resolution Data from SEPA, Weather2
- Initial Contact with Environment Agency
- Registered Scottish Parliament Committee Adviser on Environment

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