Ex-Byte

Predictive data analytics for the preventative maintenance of assets like water pipes and infrastructure.

The Ex-Byte team (formerly known as Smart Pipes) is using data-driven techniques to make intelligent predictions about failures. This helps to prioritise the selection of pipes for condition assessment while reducing the costs and minimising disruption to water supplies and the community.

The challenge

A water pipes condition assessment is expensive and disruptive – water utilities inspect one per cent of its network assets annually. Each year in Australia, 7,000 critical water main breaks occur, resulting in billions of dollars in rectification and consequence costs. In contrast, the cost of preventative maintenance is only 10 per cent of reactive repair costs.

The team developed technology that uses data analytic techniques to predict failure probability based on learned patterns. This technology can accurately predict water pipe failures, which will provide effective preventative maintenance and a reduction in customer interruptions.

The response

The team developed technology that uses data analytic techniques to predict failure probability based on learned patterns. This technology can accurately predict water pipe failures, which will provide effective preventative maintenance and a reduction in customer interruptions.

The impact

Smart Pipes technology creates significant impact for water utilities through efficient, preventative maintenance and the avoidance of supply disruptions, and benefits for consumers through more reliable water supplies.

An independent economic assessment estimated the net value of the benefits of the Smart Pipes technology was $41 million over a 10-year period, with a benefit-cost ratio of 301.2:1.

The Ex-Byte Infrastructure Team won the 2018 Eureka Prize for Excellence in Data Science (known at the time as the Smart Infrastructure Team).

Australian water utilities currently spend $1.4 billion per year on reactive repairs and maintenance.

Dr Fang Chen
University of Technology Sydney
Executive Director Data Science
Fang.Chen@uts.edu.au | Water pipe failure prediction

Australia's National Science Agency