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Leakage detection in water pipe networks using machine learning

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Leakage in the water supply system is a world problem that happens everywhere, not only in China but also in Japan, the US, and Europe. It not only results in the waste of water resources but also raises safety issues in drinking water. The traditional solution is the Minimum Night Flow method with manual leak detectors. This solution could only find leakage at night. The engineers have to search the leaking point randomly using leak detectors. It not only highly relies on domain knowledge and expertise but is also labor-consuming. The response time is quite long, might be a couple of days to several days. Here, time series analysis based on a dynamic time warping algorithm is used to detect anomalies in time series of pressure stations and flow stations, and the risk coefficient of each pipe network is determined by using a neural network combined with existing data. The water treatment plants don't even have to install new sensors if the budget is limited.