

Abstract

River and Rainfall Monitoring Using the Internet of Things

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This dissertation seeks to explore if the Internet of Things is sufficiently accurate and reliable to be employed in a real-time rainfall and river monitoring system. To investigate this, three IoT datasets are analysed and compared with each other. The first dataset was from Pervasive Nation, who have created Ireland's IoT testbed and have active 12 rainfall sensors placed around the city. The second dataset comes from VT, who have river level sensors placed around Dublin streams and rivers. Lastly, Dublin City Council have both rainfall and river level sensors placed around city.

The rainfall and river level values that each dataset reported were analysed against publicly available Met Eireann and Office of Public Works data. These values were used as the control, therefore, each sensor was compared against these values in order to evaluate how accurate the IoT data was. The networks that the IoT sensors used were also analysed by establishing how often missing data and outlier occurred. Analysis was also carried to investigate whether rainfall had any impact on river levels in order to investigate what environmental variables are needed to accurately monitor and forecast river levels.

The results of this dissertation were promising, with many sensors achieving high correlations to both the official river and rainfall values and against each other. However, some sensors performed poorly suggesting that these IoT sensors are not ready yet to be used in a real-time river and rainfall monitoring system. This dissertation has also established that more sensors and other types of weather sensors are needed in order to create an effective IoT river and rainfall monitoring system.