



Universität Stuttgart



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Universität Stuttgart · WAREM · Pfaffenwaldring 7a · 70569 Stuttgart

WAREM Seminar

July 22, 2014

Master's Thesis

Presentation

Of Hanieh Moghaddamkia

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Benefits and challenges for implementing Bayesian networks as decision support tool for inspection, maintenance and replacement of water distribution systems

A recently published report, released by the American Society for Civil Engineering (2013), states that a huge portion of the US drinking water infrastructure is “nearing the end of its useful life”. However, it is estimated that only 1/3 of the required funding for infrastructure replacement is available. The ageing of water networks results in an increase in water pipe breaks in addition to a decrease in hydraulic capacity. Considering the complexity of water distribution network deterioration processes combined with the huge investments municipalities will have to make to maintain an adequate service level, it is imperative to develop tools that will assist water supply utilities managers in selecting, among the available options, those that will minimize the total costs on the long term.

The main goal of this thesis is to investigate the possibility of using Bayesian Networks as a decision support tool for inspection, maintenance and replacement of water distribution systems. Knowing the fact that current condition assessment methodologies are either expensive or data demanding, Bayesian Networks have a good potential to assist water supply utilities to have good understanding of the condition of their infrastructure. The approach of this thesis is to explore the trade-off between different data types utilized for evaluating the condition of water pipes in distribution networks. In specific, it shall be investigated whether suitable data fusion of all cheap and readily available data sources can help overcome their limited accuracy, resulting in a reasonable information state that can be used reliably for decision making. For the data fusion, Bayesian networks shall be explored.

Date: Tuesday, July 22, 2014

Time: 17:30

Location: Pfaffenwaldring 7a, WAREM old building (wooden building)

WAREM Students and other interested parties are cordially invited.