



University of Stuttgart
Germany

Department for Stochastic Simulation
and Safety Research for Hydrosystems (LS³)

Assessment of
structural failure
risk of water
distribution pipes
using
Bayesian Belief
Networks



M.Sc. Topic

Water distribution networks (WDNs) are infrastructures that transport drinking water, which is vital for life on earth. These networks are subject to failures due to various factors such as water quality, operational and environmental issues, hydraulic properties, etc. Even though structural factors that lead to pipe failures are very common, they cannot be identified in a reliable way due to lack of data in WDNs. In this case assessment of the failure risk in WDNs with Bayesian Belief Networks (BBNs) is promising, because BBNs can cope with missing data and uncertainty. The goal of this master thesis is setting up a comprehensive Bayesian Belief Network model that focuses on the failure factors leading structural deterioration such as corrosion, pipe age, pipe length etc.

Prospective Tasks

- Literature review on structural failure of water distribution network pipes
- Modelling a causal relationship between structural failure factors of water distribution pipes using Bayesian Belief Networks
- Application of the model on different cases and comparison of the results

General Information

- Supervision by MSc. Gözde Köse and apl Prof. Dr.-Ing. Sergey Oladyshkin

Desireable Skills

- Introductory knowledge in fluid mechanics and water supply systems
- Affinity to statistics
- Basic programming skills preferably in Python or R
- Experience with software EPANET

Apply now!

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