**Optimal Placement of Pressure Gauges for Water Distribution Networks Using Entropy Theory Based on Pressure Dependent Hydraulic Simulation**

[**https://www.mdpi.com/1099-4300/20/8/576**](https://www.mdpi.com/1099-4300/20/8/576)

Goal : Use nodal pressure , entropy and uncertainty ..... failure scenarios segment-wise node with large entropy has lot of information, so important pressure gauge location.....but only detect pipe failure(abnormal conditions)..no localize.

(Single pipe failure that results in pressure change, pressure gauges are not evenly distributed, no localization, only total water demand under normal conditions considered, segment level pipe failure-open close demand 0)

**Entropy-Based Sensor Placement Optimization for Water Loss Detection in Water Distribution Networks**

[**https://link.springer.com/article/10.1007%2Fs11269-013-0419-8**](https://link.springer.com/article/10.1007%2Fs11269-013-0419-8)

Goal : Like the above paper, pressure, entropy, etc. more formulas. Take different possible entropy driven sensor configurations and through iterations of greedy search algorithm obtain OSP....again not sure localization is done.

(maximize entropy while not exceeding the allowable number of sensors, topology not considered, NO FAILURE SCENARIOS, segment level entropy not network level)

**\*\*Optimal Pressure Sensor Placement in Water Distribution Networks Minimizing Leak Location Uncertainty**

<https://www.sciencedirect.com/science/article/pii/S1877705815026491?via%3Dihub>

Goal : Use fault sensitivity matrix concept........every leak a separate FSM....leak detection and localisation

1 Clustering techniques are applied to reduce the initial set of candidate sensors S to S' such that next step is tractable.

2 An exhaustive search is applied to the reduced candidate sensor set S.

**Efficient Sensor Placement for Leak Localization Considering Uncertainties**

[**https://link.springer.com/article/10.1007/s11269-016-1504-6**](https://link.springer.com/article/10.1007/s11269-016-1504-6)

Goal : Sensitivity matrix and GA. Leak localisation done.

(Single leaks, result is more of how many sensors give what output instead of a fixed number of sensors, leak of specific size and position, sensor placement goal is to avoid places with high uncertainty, not place sensor for optimal leak localisation)

**Sensor placement for fault location identification in water networks: A minimum test cover approach**

[**https://www.sciencedirect.com/science/article/pii/S000510981630231X**](https://www.sciencedirect.com/science/article/pii/S000510981630231X)

Goal : Fault here is mostly pipe bursts. Minimum Test Cover to Minimum Set Cover. Solved with a greedy approach, which is to select, in each iteration, a sensor that detects the maximum number of undetected link failures. Another approach is augmented greedy...In each iteration of the greedy algorithm for the MTC solution, a sensor that covers (detects) the most pair-wise link failures from a total of n 2 pair-wise failures, is selected.

(Pipe bursts are failures, the algorithm is assumed to give unique different vector outputs for different single failure events and thats how they locate. No separate leak localisation applied, localisation set)

**Scaling-Laws of Flow Entropy with Topological Metrics of Water Distribution Networks**

[**https://www.mdpi.com/1099-4300/20/2/95**](https://www.mdpi.com/1099-4300/20/2/95)

Goal : Flow, entropy and topology only used to evaluate robustness of network.

**Sensor Placement and Leakage Localization considering Demand Uncertainties**

[**https://core.ac.uk/download/pdf/81132477.pdf**](https://core.ac.uk/download/pdf/81132477.pdf)

Goal : SP - Leak sensitivity matrix, OSP & leak localisation - special GA, Differential Evolution. Pressure and Flow.

(Again, consider uncertainties while placing sensors, single leaks, optimal placement for fixed number of sensors)

**Optimal Sensor Placement for Leak Location in Water Distribution Networks using Evolutionary Algorithms** \*

<https://pdfs.semanticscholar.org/9d7c/55c9313d812e767cfa0f2078acd9c9d5e662.pdf>

Goal : OSP to locate leak using LSS leak signature space and leak sensitivity matrix. GA and PSO - particle swarm optimisation.

(???)

**Optimal Sensor Placement for Leak Location in Water Distribution Networks Using Genetic Algorithms**

[**https://www.mdpi.com/1424-8220/13/11/14984/htm**](https://www.mdpi.com/1424-8220/13/11/14984/htm)

Goal : Leak sensitivity matrix. Leak location using pressure. GA for SP.

(Maximise leak isolability)

**Optimal sensor placement for classifier-based leak localization in drinking water networks**

[**https://ieeexplore.ieee.org/document/7739771/**](https://ieeexplore.ieee.org/document/7739771/)

Goal : Pressure models trained using KNN. Classifier feature selection using GA.......different leak magnitudes.

**Sensor Placement for Leak Location in Water Distribution Networks using the Leak Signature Space - same as \***

[**https://www.sciencedirect.com/science/article/pii/S2405896315016596**](https://www.sciencedirect.com/science/article/pii/S2405896315016596)

Goal : Leak location using LSS. GA and PSO

**Robust sensor placement for leak location: Analysis and design**

[**https://www.researchgate.net/publication/287107616\_Robust\_sensor\_placement\_for\_leak\_location\_Analysis\_and\_design**](https://www.researchgate.net/publication/287107616_Robust_sensor_placement_for_leak_location_Analysis_and_design)

Goal : FSM.....different leak magnitudes. Fix the number of sensors to be placed. Approach same as \*\*.

**Impact Driven Sensor Placement for Leak Detection in Community Water Networks**

[**https://dl.acm.org/citation.cfm?id=3207906**](https://dl.acm.org/citation.cfm?id=3207906)

Goal : Utility of sensor configuration - time taken to detect leak. Maximise overall utility.

**Optimal Meter Placement for Water Distribution System State Estimation**

[**https://ascelibrary.org/doi/10.1061/%28ASCE%29WR.1943-5452.0000037**](https://ascelibrary.org/doi/10.1061/%28ASCE%29WR.1943-5452.0000037)

Goal : GA

Literature Survey

**Categories:**

1. Leak Sensitivity Matrix

2. Entropy

3. Uncertainties

4. Combination of any 2 or all 3 using different algorithms, eg: GA

**ENTROPY**

1. Optimal Placement of Pressure Gauges for Water Distribution Networks Using Entropy Theory Based on Pressure Dependent Hydraulic Simulation - **Pressure Matrix**

# Entropy-Based Sensor Placement Optimization for Water Loss Detection in Water Distribution Networks

**UNCERTAINTIES & LSM**

# Efficient Sensor Placement for Leak Localization Considering Uncertainties - **GA**

# Optimal sensor placement for classifier-based leak localization in drinking water networks - **GA is main, UNC & LSM are factors in classifiers.**

# Optimal Pressure Sensor Placement in Water Distribution Networks Minimizing Leak Location Uncertainty

**LSM**

1. \*Optimal Sensor Placement for Leak Location in Water Distribution Networks using Evolutionary Algorithms - **GA & Leak Signature Space**
2. Sensor Placement for Leak Location in Water Distribution Networks using the Leak Signature Space - same as \*
3. Optimal Sensor Placement for Leak Location in Water Distribution Networks Using Genetic Algorithms - **GA**
4. Robust sensor placement for leak location: Analysis and design
5. Impact Driven Sensor Placement for Leak Detection in Community Water Networks
6. Sensor placement for fault location identification in water networks: A minimum test cover approach

**UNCERTAINTIES**

# Optimal Meter Placement for Water Distribution System State Estimation - **GA**

1. Sensor Placement and Leakage Localization considering Demand Uncertainties - **GA**