

## PAPER EVALUATION

Paper ID: JWRHE10045

Paper Title:

Virtual DMA Municipal Water Distribution Pipelines Leakage Detection and Classification Using Multi-class SVM Advanced Pattern Recognizer

Reviewer's Name: Dr. Erika Beilicci

Date: 15 January 2014

Reviewer's Email:

Review Period: **TWO WEEKS**

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**Please mark your evaluation in the suitable columns. "5" indicates the best and "1" implies the worst.**

		5	4	3	2	1	
<b>Scope</b> (very important)	Relevant		x				Irrelevant
<b>Originality</b>	High		x				Low
<b>Significance</b>	Significant		x				No new
<b>Novelty</b>	High		x				Low
<b>Survey Coverage</b>	Broad			x			Shallow
<b>Structure</b>	Excellent			x			Poor
<b>Expression</b>	Clearly			x			vague
<b>Grammar</b>	Good	x					Poor
<b>References</b>	Adequate		x				Incomplete
<b>Length</b>	Too Short				x		Too Long

Please make very detailed technical and editorial comments and suggestions directly on the manuscript. Your comments are an invaluable aid to the author(s) to help in improving the overall technical quality, utility, and readability of the material. These comments are also necessary to maintain the quality of the articles that are published in the journal. Particular attention should be given to details that guide possible revisions, or that clearly explain reasons for rejection. Please summarize comments that appear on the manuscript to help the author(s) focus on the major issues you have raised in your review.

What are the contributions of this paper?

In this paper was investigated the concept of virtual DMA as the core objective of the research to resolve the current Gap and limitations of the DMA state of practice through the development of Virtual DMA Leakage Monitoring and Classification System Using Multi-class Support Vector Machine (SVM) Advanced Pattern Recognizer. The implementation of DMA structures are usually cost intensive (installation of additional valves, prevention of dead ends with ring closure, district metered areas is the separation of the network into hydraulically discrete areas etc.). Using the proposed Virtual DMA

Multi-class SVM Advanced Pattern Recognizer using Multi-parameter measurements provide an opportunity for leakage monitoring in large measuring zones and networks without physical DMA.

The proposed methodology would benefit the water utility companies by reducing the cost and operational drawbacks associated with implementation of the physical DMA, and can improve the day to day operational decision making process by detecting and classifying the different stages of pipelines leakages and breakages according to their severity, and monitoring the future conditions in the water system which can help the operators to see the behavior of the network on the control room screens which they are familiar with and enable the operators to quickly perform the best short-term response strategy.

This research approaches also facilitates for water utility companies which are searching for innovative technology for early leakage detection and monitoring system for better managing their WDS pipeline networks.

### Recommendation ( )

	A) Accept
x	B) Revise and Accept (Minor Revision)
	C) Revise and Resubmit (Major Revision)
	D) Reject

### Comments

Comments to the Author(s)

A) If you suggest to accept this paper, please illustrate your reasons why this paper is qualified to be published in the journal in detail, or provide revision suggestions if you have any.

a) Why this paper is qualified:

The general approaches and the overall analysis and result shows good promise for the applications of this model for the benefit of system operators and decision-makers of water utility companies for selection of which pipeline infrastructure required urgent action, and engineer the optimal alternative of rehabilitation and replacement, maintenance strategies and leakage monitoring and classification using virtual DMA.

b) Revision suggestions:

- mathematical basis of problem is too laborious (too many mathematical relations) (the reader must have strong mathematical skills to understand the presentation).
- it is not sufficient clear what the figures represent in the results section (what is on coordinate axes in 2D and 3D figures, correspondence of points with points from studied site plan).

B) If you think this paper needs major modification and resubmission, please provide summary and detailed revision suggestions (on research base, research technique, paper presentation, grammar, jargon use, typesetting, reference, etc.). Please point out the section(s) where you think an error/ flaw occurs.

- Detailed revision suggestions:

C) If you think this paper should be rejected, please expound the reasons why it is not of sufficient quality/novelty or seriously flawed to be published in the journal.

- Suggestions for improvement:

Would you be willing to review a revision of this manuscript? Yes ( x ) No ( )

Thank you for your contribution and effort!