CALL FOR APPLICATION

PhD Scholarship - Industrial Postgraduate Programme (IPP)

Industry: Urban Solutions & Sustainability

Company: Visenti Pte Ltd

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Company Profile: Visenti is a global team unified in a common purpose: creating advanced technology solutions to the world’s water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services, and agricultural settings. With its October 2016 acquisition of Sensus, Xylem added smart metering, network technologies and advanced data analytics for water, gas and electric utilities to its portfolio of solutions. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.
CALL FOR APPLICATION

PhD Scholarship - Industrial Postgraduate Programme (IPP)

PhD Position: Unsupervised/Semi-supervised Learning for Big Data Segmentation and Labelling

In Visenti, large amount of sampled time-series data (e.g., acoustic, pressure, flow and water quality) are collected from different sensor clusters of various customers. These data are often noisy and have high dimensionality, and more importantly, are unlabeled. Applying these data directly to a machine learning algorithm will give unsatisfactory results due to the curse of dimensionality and unknown noise patterns. The use of filtering and feature extraction requires domain-specific expertise of the data and choosing the right feature representations is very time consuming and is the key for a successful application. In addition, valuable information could be lost in the feature extraction step.

In this proposed project, novel unsupervised or semi-supervised machine learning methods will be investigated to automatically segment the data and cluster the data into different patterns. In essence, the developed learning methods are able to provide alternatives to hand-crafted features by learning a layer of feature representations. The basic idea here is that various models will be introduced to model the features of the time-series, and nonparametric Bayesian approaches will be developed to associate the data segments either with existing features or generated new features. As such, an infinite number of data features can be explored and the information from data can be fully extracted and exploited. Hence, plentiful unlabeled data can be utilized for leakage detection and classification. The developed methods and models will be validated through the real data as well as simulations.