

Dr. Nitin Muttli

LECTURER

School of Architectural, Civil & Mechanical Engineering

Room: D431
Campus: Footscray Park Campus
Phone: +61 3 9919 4251
Fax: + 61 3 9919 4106
E-mail: nitin.muttli@vu.edu.au



Research Interests:

- Hydrologic modelling (SOBEK, SWMM, Xinanjiang, MIKE11, etc.)
- Coastal water quality modelling
- Applications of Hydroinformatics tools:
 - ✓ Data-driven modelling techniques (ANN, GP, etc.)
 - ✓ Parameter optimization / model calibration
 - ✓ Geographic Information System (GIS)
 - ✓ Data mining and knowledge discovery

Research Projects:

Hydrologic runoff simulation for Marina catchment in Singapore

Working as a Research Associate at the Tropical Marine Science Institute (TMSI) of National University of Singapore, Nitin had worked on a project dealing with the hydrologic runoff simulation for the Marina catchment. Nitin's part involved the application of the Delft Hydraulics' rainfall-runoff modelling software named Sobek. Within Sobek, a rainfall-runoff concept was developed for the Marina catchment, which is a highly urban catchment. The project also involved setting up the SOBEK model, which used various hydrologic data, GIS-based spatial data and tidal data at the Marina Bay. For various event based storms, the model was calibrated using an enhanced Genetic Algorithm, which incorporated parallel computing to speed up the calibration process. The calibrated model was tested on few "test" storms and the results were quite good.

Data-driven modelling of harmful algal blooms

During Nitin's research work at Hong Kong, he had worked on a project dealing with water quality modelling in the coastal waters around Hong Kong. It dealt with the prediction of harmful algal blooms (HAB) (or red tides) using data driven modelling techniques like artificial neural networks (ANN) and genetic programming (GP). Since the ecological processes in coastal waters are extremely complicated, other than predicting the algal blooms, data-driven / data-mining techniques were also used for understanding the causality and dynamics of algal blooms.

Selected Papers

Muttill, N. and Chau, K. W. (2007). Machine Learning Paradigms for Selecting Ecologically Significant Input Variables, *Engineering Applications of Artificial Intelligence*, Vol. 20, No. 6, pp. 735 - 744.

Chau, K. W. and **Muttill, N.** (2007). Data Mining and Multivariate Statistical Analysis for Ecological System in Coastal Waters, *Journal of Hydroinformatics*, Vol. 9, No. 4, pp. 305 - 317.

Jayawardena, A. W., **Muttill, N.** and Lee, J. H. W. (2006). Comparative Analysis of a Data-Driven and a GIS based Conceptual Rainfall-Runoff Model, *Journal of Hydrologic Engineering*, ASCE, Vol. 11, No. 1, pp. 1-11.

Muttill, N. and Lee, J. H. W. (2005). Genetic Programming for Analysis and Real-Time Prediction of Coastal Algal Blooms, *Ecological Modelling*, Vol. 189, No. 3 - 4, pp. 363 - 376.

Other Web Links

http://www.staff.vu.edu.au/nmuttil/publication_List.html