

KEYNOTE SPEAKER - 1

Feature Selection in Data-Driven Systems Modelling

Prof Qiang Shen

Director, Institute of Mathematics, Physics and Computer Science
Aberystwyth University, Wales, UK.

Email: qqs@aber.ac.uk

Summary

Feature selection (FS) addresses the problem of selecting those system descriptors that are most predictive of a given outcome. Unlike other dimensionality reduction methods, with FS the original meaning of the features is preserved. This has found application in tasks that involve datasets containing very large numbers of features that might otherwise be impractical to model and process (e.g., large-scale image analysis, text processing and Web content classification).

This talk will focus on the development and application of FS mechanisms based on rough and fuzzy-rough theories. Such techniques provide a means by which data can be effectively reduced without the need for user-supplied information. In particular, fuzzy-rough feature selection (FRFS) works with discrete and real-valued noisy data (or a mixture of both). As such, it is suitable for regression as well as for classification. The only additional information required is the fuzzy partition for each feature, which can be automatically derived from the data. FRFS has been shown to be a powerful technique for data dimensionality reduction. In introducing the general background of FS, this talk will first cover the rough-set-based approach, before focusing on FRFS and its application to real-world problems. The talk will conclude with an outline of opportunities for further development.

Speaker's Biography

Professor Qiang Shen received a PhD in Knowledge-Based Systems and a DSc in Computational Intelligence. He holds the Established Chair of Computer Science and is Director of the Institute of Mathematics, Physics and Computer Science at Aberystwyth University. He is a Fellow of the Learned Society of Wales, a UK REF 2014 panel member for Computer Science and Informatics, and a long-serving Associate Editor of two IEEE flagship Journals (*IEEE Transactions on Cybernetics* and *IEEE Transactions on Fuzzy Systems*). He has chaired and given keynotes at numerous international conferences.



Professor Shen's current research interests include: computational intelligence, reasoning under uncertainty, pattern recognition, data mining, and their real-world applications for intelligent decision support (e.g., crime detection, consumer profiling, systems monitoring, and medical diagnosis). He has authored 2 research monographs and over 340 peer-reviewed papers, including an award-winning IEEE Outstanding Transactions paper. Qiang has served as the first supervisor of over 40 PDRAs/PhDs, including one UK Distinguished Dissertation Award winner.