GUEST EDITORIAL

PATTERN RECOGNITION: PART II

This is the second of three special issues of the SAIEE Africa Research Journal devoted to selected papers from the Pattern Recognition Association of South Africa’s 2006 workshop held in Parys, South Africa from 29 November to 1 December 2006. This workshop was peer-reviewed and each paper was reviewed by at least two reviewers. Reviewers could recommend a reviewed paper to the technical chairs for publication in these special issues of the SAIEE Africa Research Journal. A total of fifteen papers passed the second round of the review process for publication in these special issues.


The first paper in this issue, An Adaptive Strategy for the Classification of G-Protein Coupled Receptors, by Mohamed, Rubin and Marwala introduces the use of a classification system based on an evolutionary strategy, incremental learning and the Fuzzy ARTMAP, to realise a protein classification system for the GPCR protein superfamily that allows an all-versus-all comparison of these proteins. Being an incremental system, the classifier is dynamic and has the ability to incorporate new information into the classification model. Test results indicate that the new system shows good accuracy.

In the paper entitled A Comparison of Data-Driven and Model-Driven Approaches to Brightness Temperature Diurnal Cycle Interpolation the authors, van den Bergh, van Wyk, van Wyk and Udalhemuka, present two new schemes for interpolating missing samples in satellite diurnal temperature cycles. Here, missing samples are usually caused by brief periods of cloud cover. The first method, an improvement of the cosine model, gives good results. The second method, based on Reproducing Kernel Hilbert Space Interpolators, also gives good results with the additional ability to model effects not accounted for by the cosine model.

The relationship between the distribution of data, on one hand, and classifier performance, on the other, for non-parametric classifiers is studied by van der Walt and Barnard in their paper, Data Characteristics that Determine Classifier Performance. The authors show that predictable factors such as the available amount of training data, the spatial variability of the effective average distance between data samples and the type and amount of noise influence such classifiers significantly. A detailed understanding of classifier selection and design can be obtained by applying the methods developed in this paper.

The notion of a receiver operator characteristic plot allows a classifier to be evaluated and optimised over all possible operating points. The area under the receiver operator characteristic has become a standard performance criterion in two-class pattern recognition problems, used to compare different classification algorithms independently of operating points, priors and costs. In their paper entitled A Simplified Volume Under the ROC Hypersurface, Langrebe and Duin extend this to the multiclass case, which they refer to as the volume under the receiver operator characteristic hypersurface. This paper concludes Part II of the Special Issue on Pattern Recognition.

MA van Wyk and BJ van Wyk
Guest Editors