Special Issue of the IEEE Transactions on Neural Networks

White Box Nonlinear Prediction Models

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Scope of the Special Issue

Predictive modeling aims at predicting the future using patterns learned on past data. Both classification and regression are key predictive modeling activities. For both tasks, a myriad of techniques have been introduced, going from simple linear regression, to advanced nonlinear prediction methods such as neural networks, support vector machines, and kernel methods in general. Although nonlinear techniques typically provide the most accurate predictive models, they are often not suitable to be used in many practical application domains because of their lack of transparency and comprehensibility. In domains where validation of the underlying model is required, e.g., credit risk analysis and medical diagnosis, a clear insight into the reasoning made by the nonlinear prediction model is necessary and desired. It is the purpose of this special issue to solicit papers discussing various ways of making nonlinear prediction models more interpretable and transparent, illustrated in domains where model understandability is a key requirement.

Potential topics include (but not limited to):

- Nonlinear modeling techniques (neural networks, SVMs, kernel methods, …)
- Integrating domain knowledge into nonlinear models
- Rule extraction from nonlinear models (decompositional, pedagogical, eclectic approaches, …)
- Sensitivity analysis and input selection methods
- Semisupervised learning (transductive approaches, co-training, …)
- Active learning (cost-based learning, intelligent sampling, data generation, …)
- Graph-based methods and representations
- Two stage models
- Model correctness (model performance, model interpretability, model justifiability)
- Real-life applications (business, medical, public sector, bio-informatics, web, …)

Submission Instructions

Both Regular (full) and Brief papers can be submitted. All papers for the special issue should be submitted by **May 31st, 2010** to the TNN submission webpage for review using Manuscript Central. Please log on to http://mc.manuscriptcentral.com/tnn and follow the directions for submission of your papers. On the first page of the submitted manuscript as well as on the Author's Cover Letter (during the submission procedure), please indicate clearly that the manuscript is submitted to the *TNN Special Issue on White Box Nonlinear Prediction Models*. Before submission, please read carefully the Information for Authors on the TNN webpage: http://ieee-cis.org/pubs/tnn

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