

**Rissanen, Jorma** (Helsinki Institute for Information Technology, Finland)  
*Order Selection with Stochastic Complexity*

**Abstract:** The likelihood function, maximized over each given number of parameters, does not integrate to unity and hence is not a probability model of data. However, with a suitable normalization it becomes a universal *NML* (Normalized Maximum Likelihood) model, whose negative logarithm is the *stochastic complexity*. The normalizing coefficient can be interpreted as the largest number of models with the given number of parameters that can be reliably distinguished from the data available. When the stochastic complexity is minimized over the number of parameters or, equivalently, the probability the *NML* model assigns to the data is maximized, we get a model selection criterion which takes advantage of all the information about the models the data can provide.

In this talk I discuss the calculation of the *NML* universal model for the linear-quadratic regression models, including the AR models, and demonstrate the superiority of the resulting order selection criterion in computer generated data. Time permitting I also discuss briefly the more general ARMA models.