A BINOMIAL DISTRIBUTION WITH DEPENDENT TRIALS AND ITS USE IN STOCHASTIC MODEL EVALUATION

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ABSTRACT

A model of Markov dependent trials is considered that leads to a generalization of the binomial distribution in the context of evaluating models of a time series by exploiting the sequential nature of model-based predictions. Adopting an evaluation method similar in nature to that suggested by Xekalaki & Katti (1984), the behaviour of the model is assigned a score that reflects the concordance or discordance of predicted and observed values for each of a sequence of points in time. The resulting series of scores leads to a final rating which is considered as a measure of the predictive ability of the model. The Markov dependent distribution is used to develop exact theory for the construction of confidence intervals and for testing hypotheses pertaining to the forecasting protential of a model. Some asymptotic theory is also developed.

Keywords & Phrases: Model evaluation, Model validation, dependent Bernoulli trials, Forecasting models.