Abstract

In this talk we introduce the negative binomial regression model to allow for overdispersion in count regression data. This model falls within the class of generalized linear models (GLM) for a known overdispersion parameter. We discuss two model selection criteria for these models. The first one is the classical deviance, while the other one is the Bayes factor arising in a Bayesian analysis. While the deviance can only be used in comparing nested models, Bayes factors can be applied to nonnested models. Raftery (Biometrika 1996) developed an approximation for Bayes factors in general GLM's. We apply and extend this approach to Poisson and negative binomial regression models with possibly different covariate vectors. Finally we discuss the problem on how to quantify overdispersion effects for these models using p-value curves. The approaches are illustrated on a data set involving the modeling of the relationship of the number of patents on annual sales and research and development spending.