



## On Modelling Count Data from a Discrete Decreasing Distribution

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Within the framework of using mixtures for modelling counts from some discrete distribution, the Poisson mixture model is a common choice owing to its flexibility. Suppose that the discrete distribution under study is assumed to be decreasing, then the Poisson mixture model is not very suitable, for the fitted distribution might not be a decreasing distribution. We define a distribution called the discrete decreasing beta mixture distribution that has fitted probabilities conforming with the assumption of decreasing probabilities. We consider the method of least squares for estimating the model parameter and the method of cross-validation for selecting the common parameter. Through two real-world examples, we demonstrate the performance of our model, and methods of estimation and selection.

**Keywords:** Cross-validation; decreasing distribution; least squares estimation; mixtures.