

ABSTRACT

ESTIMATION OF THE PARAMETERS OF POISSON-GAMMA MODEL USING THE EM (EXPECTATION MAXIMIZATION) ALGORITHM

By

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Poisson model is a discrete probability distribution that express the probability of a given number of events occurring in a specific interval of time and in has same average rate and variance, however in fact, it often happens that variance of response can be greater than the average rate or overdispersion. Overdispersion will bring consequences on the expected value for the smaller standard error (under estimate) which turns out errors on inference for those parameters. There is a way to overcome this problem which is with adding information with the prior distribution, it could be gamma. Thus, poisson model turns into a two-stage model, poisson-gamma model. In this case, one parameter of poisson-gamma model can't be solved analitically, so the way that can be used is numerical solution such as the newton-raphson method. This research would have estimated the parameters, the method that will be used is EM (Expectation Maximization) algorithm.

Keyword: *Poisson-Gamma Model, Overdispersion, EM (Expectation Maximization) Algorithm.*