WEIGHTED POISSON DISTRIBUTIONS FOR OVERDISPERSION AND UNDERDISPERSION SITUATIONS

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Abstract. The main goal of this paper is to introduce new exponential families, that come from the concept of weighted distribution, that include and generalize the Poisson distribution. In these families there are distributions with index of dispersion greater than, equal to or smaller than one. This property makes them suitable to fit discrete data in overdispersion or underdispersion situations. We study the statistical properties of the families and we provide a useful interpretation of the parameters. Two classical examples are considered in order to compare the fits with some other distributions. To obtain the fits with the new family, the study of the profile log-likelihood is required.

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