

The thesis summarizes the theory of mixed Poisson models. Poisson distribution is one of the popular distributions in modelling count data, but its use is limited because it requires equidispersion. Because of this we introduce both continuous and finite mixtures. From continuous mixtures the main representative is the negative binomial model, which arises as Poisson Gamma mixture, while from discrete models we deal mainly with zero-inflated models and hurdle models. For these models we use the maximum likelihood estimates of their parameters. In the end we apply these models to fit automobile insurance data from Australia, where we use MLE to fit Poisson regression, negative binomial regression and Poisson hurdle regression.