Abstract

This thesis deals with the problem of estimating the transition rate matrix of a continuous-time Markov chain using discretely observed figures. First chapter contains a simply way to estimate the matrix from the continuous observation via maximum likelihood method. Next chapter describes estimating from the discrete data, where firstly we calculate the transition matrix. Full description of the EM algorithm follows in the next chapter. The last procedure of estimating the transition rate matrix described in this work is the Monte Carlo Markov Chain. All methods are implemented in the selected software and all results are commented in the second part of the thesis. Here we compare the precision of the estimators using daily, weekly and monthly observation for a 5 year period. The last comparison contains the result from the daily observation of a 5 year period and a 10 year period. Matrices are also provided with the estimated variances and confidence intervals.