

This thesis covers non-homogeneous Poisson processes along with estimation of the intensity (rate) function and some selected simulation methods. In Chapter 1 the main properties of a non-homogeneous Poisson process are summarized. The main focus of Chapter 2 is the general maximum likelihood estimation procedure adjusted to a non-homogeneous Poisson process, together with some recommendations about calculation of the initial estimates of the intensity function parameters. In Chapter 3 some general simulation methods as well as the methods designed specially for log linear and log quadratic rate functions are discussed. Chapter 4 contains the application of the described estimation and simulation methods on real data from non-life insurance. Furthermore, the considered simulation methods are compared with respect to their time efficiency and accuracy of the simulations.