Abstract

This thesis discusses the use of segmented point process models to model the data generated by an Industrial maintained system working under changing / dynamic environments allowing the data generated by these systems to be split into segments at specific points known as the change points. Each segment is then modelled by an individual point process model.

Questions of interest are, the need for development of segmented point process models, identifying the location of a change point or multiple change points, modelling of the segments generated by the change points, and the interpretation and uses of these models.

The thesis starts with enumeration of the point process models generally used to model the data from maintained systems. The use of these models for decision making and their shortcomings are brought out which motivate the introduction of segmented point process models.

A survey of the literature for segmented point process models is carried out and these models are applied to maintained systems under suitable assumptions with and without covariates. The inference for these models is presented. These models are then fit to the Industrial maintained systems data using the R package. The advantages of using these models over the normal models are brought out.

The use of these to meet the needs of Industrial maintenance is depicted and a framework for use of these models on a regular basis developed. The areas of further work on these models are delineated.

Keywords: Segmented point process model, Point process, Change point, Maintained system