

# Abstract

A spatial point process is a random pattern of points in a  $d$ -dimensional space, where  $d$  usually equals to 2 or 3 in applications. Those points can represent the location of objects or events of interest. Having observed a real world spatial point pattern, spatial point processes can be useful in modeling the point pattern.

This thesis introduces theory of spatial point processes, and focuses on studying the spatial point patterns of trees in forests. Chapter 2 introduces the theory of spatial point processes, including its definition and some properties. Model fitting procedure comes in Chapter 3 and Chapter 4. In Chapter 3, Spatial Poisson Process model is fitted into our three real world datasets, while inferences are given. A new model is proposed in Chapter 4 to improve our model fitting outcome.

Finally, conclusion is made in the last chapter, together with the limitations of this thesis and possible improvements in the future.