



BISP8

**Eighth Workshop on  
BAYESIAN INFERENCE IN STOCHASTIC PROCESSES**

## **Bayesian Inference for the Compound Poisson Process**

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The Bayesian approach for making inference has become very popular in several areas due to its advantage of combining all available information in a probability distribution. It allows us to include many levels of randomness in the analysis through the use of prior distributions for each parameter, which highlights the uncertainty regarding individual distributions or parameters and enables us to incorporate any prior knowledge we have. Under the Bayesian approach, we assume that all parameters in the model are random and have suitable prior distributions, which we update with the data. This approach reflects the uncertainty inherent in estimating these unknown values and the posterior distributions derived give us an indication of how reliable the inferences are. In this study, a methodology to implement Bayesian inference for the parameters for the compound Poisson process (CPP) is proposed. We deal with a specific example of the CPP and see how we can apply the techniques in this instance to learn about the parameters of a variety of CPP models. We compare the results to those derived from classical methods.

### **Keywords:**

compound Poisson process ; Bayesian inference; model uncertainty.

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**ABSTRACT  
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