



BISP8

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

Time to consider time, and time to predict?

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The purpose of this talk is to illustrate the important but often neglected role which time has in the statistical treatment of causal problems. Another motivation is to provide a demonstration of how the tools offered by Bayesian modeling and inference, which likewise seem to have largely been ignored in the mainstream statistical literature on causality, can be usefully applied in this context. To offer a concrete example, I consider a particular problem, exploring the effect which the type of day care appears to have on the incidence of acute middle ear infections in small children. Existing epidemiological knowledge is used in setting up a stochastic model, which is formulated in terms of a suitably defined marked point process. In this context, the important role of the concept of local independence is stressed. A combination of Bayesian inferential methods and an application of MCMC sampling in the numerical work are then shown to lead to immediately useful and understandable quantitative results, formulated in terms of predictive distributions of future observables. The approach adopted here differs in several respects from those currently considered standard in causal modeling and inference. The talk ends with some conclusions of a general nature.

Keywords:

event history analysis; marked point processes; causal inference; Bayesian inference; predictive distributions; local independence.

**ABSTRACT
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