Speaker: Christian Rohrbeck (University of Bath)

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Title: Bayesian ordinal regression under a monotonicity constraint

Abstract:
Compared to the nominal scale, the ordinal scale for a categorical outcome variable has the property of making a monotonicity assumption for the covariate effects meaningful. This assumption is encoded in the commonly used proportional odds model, but there it is combined with other parametric assumptions such as linearity and additivity. This talks introduce a Bayesian non-parametric model, and the only condition imposed is that the effects of the covariates on the outcome categories are stochastically monotone according to the ordinal scale. The model is based on a marked point process construction, which allows it to approximate arbitrary monotonic regression function shapes, and has a built-in covariate selection property. We study performance of the proposed approach through simulation studies, and demonstrate its practical application in two real data examples.