Regularized Inference for Branching processes data

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Abstract

Branching processes and their variants are frequently used to model evolving populations in a variety of scientific fields such as criminology, biochemical processes, and epidemiology. In some these applications, it is common that a variety of features are observed along with the branching process variable and the goal is to understand the effect of features on the mean of the branching process. Additionally, there are applications where several branching processes are observed along with a variable of interest and the goal is to understand the effect of some functional of the branching processes on a parameter representing the variable of interest. In this presentation, we describe a *branching regression model* approach to address both the problems and describe penalized inference methodology for estimation and hypothesis testing. We also describe the consistency and oracle property of the penalized estimators of the regression coefficients of the branching regression model.