NONPARAMETRIC BAYESIAN INFERENCE FOR HAWKES PROCESSES

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Abstract: In this work I will discuss recent and ongoing work on goodness-of-fit testing under local differential privacy constraints. There are two broad classes of locally private procedures: simple non-interactive procedures and interactive procedures where communication is allowed between individual data holders. One of the main conclusions of our work is that the minimax separation rates are significantly faster using interactive mechanisms. We start by finding the minimax separation rates for testing multinomial or more general discrete distributions. We construct efficient randomized algorithms and test procedures, in both the case where only non-interactive privacy mechanisms are allowed and also in the case where all sequentially interactive privacy mechanisms are allowed, and establish a gap between the rates. We prove general information theoretical bounds that allow us to establish the optimality of our algorithms among all pairs of privacy mechanisms and test procedures, in most usual cases. Considered examples include testing uniform, polynomially and exponentially decreasing distributions. Further, we find separation rates in the continuous setting and consider examples such as uniform, beta, normal and pareto distributions.