

Title: Dynamic Bayesian Estimation in Diffusion Networks

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Abstract:

The common use of ad-hoc networks and their growing complexity brings the question of reliable distributed estimation of variables describing the environment of interest. One of the commonly used methods is a centralized approach, where the network nodes communicate their data with a single specialized point. However, this method suffers from high communication overheads and represents a potentially dangerous concept with a single point of failure needing special treatment. Our aim is to contribute to another quite recent method called diffusion estimation. Here, the operating environment is decentralized; the network nodes communicate just within a close neighbourhood. For the modelling and estimation the Bayesian framework is adopted. Unlike in the traditional approaches, in each case a particular model is taken into account. This leads to a very scalable and universal method, applicable to a wide class of different models. As an example, we show application of the method to a selected member of the exponential family.