
On the two-filter approximations of marginal smoothing distributions in general state space models

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Abstract

The approximation of the smoothing distribution of a state conditional on the observations from the past, the present, and the future is a crucial problem in general state space models. In this talk, we provide a rigorous analysis of such approximations of smoothed distributions provided by the two-filter algorithms. These two-filter approaches combine a forward filter approximating the filtering distributions with a backward information filter approximating a quantity proportional to the posterior distribution of the state given future observations. We extend the results (exponential deviation inequalities, central limit theorems) available for the approximation of smoothing distributions to these procedures and in particular to the proposed methods whose complexity grows linearly with the number of particles.

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