



Minisymposium 7 - Stochastic algorithms and Markov processes

On stability of the optimal filter

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Estimating a Markovian signal process observed with independent noise has many important applications not only in engineering sciences. The optimal estimate of the signal depends, of course, on the one hand on the observations but on the other hand also on the initial state of the signal. Since the signal is not observed directly, its initial state, however, is unknown. It is therefore our interest to understand the dependence of the optimal filter w.r.t. the initial state. In our talk we show how a variational approach can be used to understand this dependence and how to obtain explicit a priori lower bounds of variational type on the rate of stability. Our results are helpful for the design of efficient measurements. We will also have a closer look at a particular class of signal processes with multiplicative noise arising in the theory of software reliability.