General Discussion

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General Discussion

Noise in Recursive Bayesian update

Sandipan Dey General Discussion · 3 days ago · Edited

Since the very nature of the Bayesian posterior distribution update is recursive in nature, we can change posterior to prior to account for some new data we obtain everytime and update the posterior consequently, as shown in the lectures.

Does not this update become susceptible to noise in the prior / new data? Can we get rid of noisy updates?

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Herbie Lee Staff · 3 days ago

A Bayesian update does not, itself, create any noise. However any procedure (Bayesian, Frequentist, maximum entropy, or otherwise) is susceptible to any noise that is present. The Bayesian approach generally provides more smoothing of noise than the Frequentist approach does, and so the Bayesian approach is generally more robust in noisy settings than the Frequentist approach is, or else a Frequentist has to use ad-hoc smoothing methods to compensate.

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Sandipan Dey · 2 days ago · Edited

Thanks professor for the reply. In some earlier Coursera course we were introduced to Kalman and Particle Filters, the first one as the best Bayesian linear filter and the second one as a nonlinear Bayesian filter.

The iterative state update equations seemed to be complicated but it was somewhat similar to the sequential Bayesian posterior updates. So i was just wondering whether KF can be thought of as a more robust version of recursive Bayesian update, and if so can we understand why it is so intuitively?

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Herbie Lee Staff · 5 hours ago

KF can be understood as a Bayesian style update. There is also a more fully Bayesian approach called Forward Filtering Backward Sampling

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