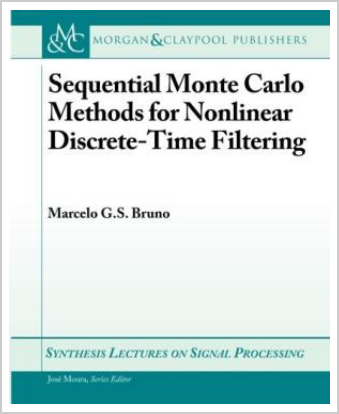

Sequential Monte Carlo Methods for Nonlinear Discrete-Time Filtering

By Marcelo G. S. Bruno

Morgan & Claypool. Paperback. Book Condition: New. Paperback. 100 pages. Dimensions: 9.2in. x 7.5in. x 0.2in.In these notes, we introduce particle filtering as a recursive importance sampling method that approximates the minimum-mean-square-error (MMSE) estimate of a sequence of hidden state vectors in scenarios where the joint probability distribution of the states and the observations is non-Gaussian and, therefore, closed-form analytical expressions for the MMSE estimate are generally unavailable. We begin the notes with a review of Bayesian approaches to static (i. e. , time-invariant) parameter estimation. In the sequel, we describe the solution to the problem of sequential state estimation in linear, Gaussian dynamic models, which corresponds to the well-known Kalman (or Kalman-Bucy) filter. Finally, we move to the general nonlinear, non-Gaussian stochastic filtering problem and present particle filtering as a sequential Monte Carlo approach to solve that problem in a statistically optimal way. We review several techniques to improve the performance of particle filters, including importance function optimization, particle resampling, Markov Chain Monte Carlo move steps, auxiliary particle filtering, and regularized particle filtering. We also discuss Rao-Blackwellized particle filtering as a technique that is particularly well-suited for many relevant applications such as fault detection and inertial navigation. Finally, we...

Reviews

An exceptional book and also the font utilized was intriguing to read. This is for all who statte there was not a worth reading. It is extremely difficult to leave it before concluding, once you begin to read the book.

-- ***Prof. Tyson Hilpert***

It is really an awesome ebook that I have ever read. It typically fails to expense a lot of. I am very easily can get a enjoyment of studying a written ebook.

-- ***Delphia Fay***