Optimization of sequential decisions by least squares Monte Carlo method

The present paper considers the sequential decision optimization problem. This is an important class of decision problems in engineering. Important examples include decision problems on the quality control of manufactured products and engineering components, timing of the implementation of climate change adaptation measures, and evacuation of people and assets in the face of an emerging natural hazard event. Focusing on the last example, an efficient solution scheme is proposed by Anders and Nishijima (2011). The proposed solution scheme takes basis in the least squares Monte Carlo method, which is proposed by Longstaff and Schwartz (2001) for pricing of American options. The present paper formulates the decision problem in a more general manner and explains how the solution scheme proposed by Anders and Nishijima (2011) is implemented for the optimization of the formulated decision problem. For the purpose to demonstrate the use and advantages two numerical examples are provided, which is on the quality control of manufactured products.

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