

The Elimination Algorithm for the Optimal Stopping of Markov Chain and its Applications

Isaac Sonin *Dept. of Mathematics, UNC at Charlotte, Charlotte, NC, USA*

To Ester Samuel-Cahn - one of the pioneers of Optimal Stopping and many other good things, with appreciation, on the occasion of a conference in her honor.

The optimal stopping (OS) of a Markov chain (MC) is a classical problem of stochastic control. Its solution, at least on a principal level, is well known. Since most of practical problems of optimal stopping in mathematical finance or mathematical statistics usually are given on a finite time interval or in a nonmarkovian form, the attention of researchers was shifted to specific problems, and to development of specific methods for specific problems. It is worth to recall the words of T. Ferguson: "Most problems of optimal stopping without some form of Markovian structure are essentially untractable". The main goal of the talk is to show that the Elimination Algorithm of OS of MC developed earlier by the author (see [1] and [2]) can be also applied to the calculation of a generalized Gittins index $\alpha(x)$ for MC (see [3]) and to some other problems of stochastic control, including a generalization of a Kathehakis and Veinot Restart in a State model to a multiple restart set.

References

- [1] Sonin, I.M., 1999, The Elimination Algorithm for the Problem of Optimal Stopping, *Math. Meth. of Oper. Res.*, **49**, no. 1, 111-123
- [2] Sonin I.M., 1999, The State Reduction and related algorithms and their applications to the study of Markov chains, graph theory and the Optimal Stopping problem, *Advances in Mathematics* **145**, 159-188.
- [3] Presman E.L., Sonin I.M., Gittins Type Index Theorem for Randomly Evolving Graphs, pp. 567-588, in: *From Stochastic Calculus to Mathematical Finance. The Shiryayev Festschrift*, Kabanov, Y.; Lipster, R.; Stoyanov, J. (Eds.), Springer, 2006.