

An algorithm to solve optimal stopping problems for one-dimensional diffusions

Ernesto Mordecki¹

Abstract: Considering a real-valued diffusion, a real-valued reward function and a positive discount rate, we provide an algorithm to solve the optimal stopping problem consisting in finding the optimal expected discounted reward and the optimal stopping time at which it is attained.

Our approach is based on Dynkin's characterization of the value function. The combination of Riesz's representation of r -excessive functions and the inversion formula gives the density of the representing measure, being only necessary to determine its support. This last task is accomplished through an algorithm. The proposed method always arrives to the solution, thus no verification is needed, giving, in particular, the shape of the stopping region. Generalizations to diffusions with atoms in the speed measure and to non smooth payoffs are analyzed. Joint work with Fabián Crocce ([arXiv:1909.10257](https://arxiv.org/abs/1909.10257))

¹ Universidad de la República, Uruguay and CNRS, IECL, Nancy, France.