

Optimal Stopping and Lévy Processes

Dr. Erik Baurdoux, Department of Statistics, LSE

<http://stats.lse.ac.uk/baurdoux>

e.j.baurdoux@lse.ac.uk

Basic details:

- Core Audience: Any interested PG student
- Course Format: advanced/optional (10 hours at 2 hours per week)

Overview:

We start with the classical secretary problem, where our aim is to choose the best candidate out of a number of applicants appearing in front of us in a random order, without having the option of going back to a previously rejected applicant. This example of an optimal stopping problem has been well studied (and still is!) and it will illustrate in a rather simple setting some important features of optimal stopping problems. We will then move our attention to Lévy processes, which form a surprisingly rich class and for example include Brownian motion and (compound) Poisson processes. In recent years they have found many financial applications, one of which is the study of so-called American options.

Prior knowledge of Lévy processes is not required for this course as we will derive or discuss some of their main properties, though some familiarity with stochastic processes would be helpful.

We study in detail a couple of well-known optimal stopping problems, such as the American put, Russian options and an optimal prediction problem, where the aim is to approximate optimally the time at which a Lévy process attains its maximal value. By studying these examples, we will also be focusing on some important concepts from the general theory of optimal stopping.

Material:

Lecture notes will be provided, as well as references to (optional) further reading.