

Abstract

In this lecture, we give a short introduction to the theory of rough paths initiated by Terry Lyons at the end of the 90's. This theory provides us with a way to define integrals and differential equations driven by irregular paths. It is particularly suitable to define stochastic integrals and stochastic differential equations driven by other processes than the Brownian motion or semi-martingales.

This theory has for example proved to be fruitful when used with Gaussian processes, for numerical computations (the so-called cubature formula) and now, and more recently for dealing with some stochastic partial differential equations.

In this lecture, we focus on the main concepts and results of this theory (Young integrals, the sewing lemma, defining integrals and differential equations driven by rough paths, ...).