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Research field: Probability theory

Key words: Infinite dimensional analysis, Malliavin calculus, Rough paths, Stochastic analysis on loop spaces, Functional inequalities, Stochastic differential equations, Rough differential equations

Present research: I am interested in probability theory and infinite dimensional analysis arsing from the study of problems in probability theory. For example, I am studying the semi-classical limit of infinite dimensional Schrödinger operators, asymptotic behavior of the spectral gap on loop spaces. In these studies, functional inequalities, *e.g.*, logarithmic Sobolev inequalities, play important role and I am interested in the study of functional inequalities also. Solutions of stochastic (or rough) differential equations are typical non-linear functionals in probability theory and the study is important from both sides of the theory and applications. In this respect, I am interested in rough path analysis and Malliavin calculus.

Notice for students: Students who want to study in my laboratory should be familiar with Lebesgue integration, discrete martingale theory and basic functional analysis as well as calculus and linear algebra.