Name: Hiroki Masuda

Research field: Theoretical statistics and probability theory

Key words: Statistical inference, Lévy process, statistical modeling of population dynamics

Present research: I am studying the statistics of Lévy processes and Lévy process driven models, where the Lévy process is the continuous-time random walk realized in Poisson space or Wiener-Poisson space. The various non-Gaussianity often hinder unified analysis, but I am interested in constructing statistical methods that balance both theory and practice. Related stochastic-process theory, stochastic analysis, and limit theorem are also subject to research as needed.

More specific research subjects include elucidation of asymptotic optimal phenomena in the estimation of pure non-Gaussian Lévy processes, quasi-likelihood analysis of Gaussian and non-Gaussian types and their complementary properties, regularization (both sparse and non-sparse) estimation, information criteria, robustification of the quasi-likelihood methods, inference for hidden Markov-process models, the exponential ergodicity of diffusion process with jumps, random number generation of Lévy process and Lévy driven models, among others. These are partially or totally interrelated.

Recently, I am participating in a software development project for stochastic processes and am also interested in applying stochastic process modeling to life sciences. Relatedly, I am working on the estimation and multivariate analysis of population dynamics.

Notice for the students: It is required to have the basic knowledge of mathematically describing and handling statistical models, such as measure-theoretic probability theory, mathematical statistics, and statistical asymptotic theory.