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| Soggetti | Statistics Mathematical statistics Probabilities R (Computer program language) Statistics and Computing/Statistics Programs Probability and Statistics in Computer Science Probability Theory and Stochastic Processes |
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| Sommario/riassunto | The YUIMA package is the first comprehensive R framework based on S4 classes and methods which allows for the simulation of stochastic differential equations driven by Wiener process, Lévy processes or fractional Brownian motion, as well as CARMA processes. The package performs various central statistical analyses such as quasi maximum likelihood estimation, adaptive Bayes estimation, structural change point analysis, hypotheses testing, asynchronous covariance estimation, lead-lag estimation, LASSO model selection, and so on. YUIMA also supports stochastic numerical analysis by fast computation of the expected value of functionals of stochastic processes through |

automatic asymptotic expansion by means of the Malliavin calculus. All models can be multidimensional, multiparametric or non parametric. The book explains briefly the underlying theory for simulation and inference of several classes of stochastic processes and then presents both simulation experiments and applications to real data. Although these processes have been originally proposed in physics and more recently in finance, they are becoming popular also in biology due to the fact the time course experimental data are now available. The YUIMA package, already available on CRAN, can be freely downloaded and this companion book will make the user able to start his or her analysis from the first page. Contains both theory and code with step-by-step examples and figures Uses YUIMA package to implement the latest techniques available in the literature of inference for stochastic processes Shows how to create the description of very abstract models in the same way they are described in theoretical papers but with an extremely easy interface Stefano M. Iacus, PhD, is full professor of statistics the Department of Economics, Management and Quantitative Methods at the University of Milan. He has been a member of the R Core Team (1999-2014) for the development of the R statistical environment and now member of the R Foundation. His research interests include inference for stochastic processes, simulation, computational statistics, causal inference, text mining, and sentiment analysis. Nakahiro Yoshida, PhD, is a professor at the Graduate School of Mathematical Sciences, University of Tokyo. He is working in theoretical statistics, probability theory, computational statistics, and financial data analysis. He was awarded the Japan Statistical Society Award in 2009 and the Analysis Prize from the Mathematical Society of Japan in 2006.
