

Simulation and Inference for Stochastic Differential Equations in R with Applications to Finance

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The course plan to cover the following topics: simulation of solutions of stochastic differential equations, quasi-maximum likelihood estimation; model selection; analysis of financial time series; clustering of financial time series; change point analysis for the volatility in stochastic differential equations.

Students are required to have basic knowledge of the R statistical package and come with a pre-installed version of the software on their machines. Software is available here <http://www.R-Project.org>. The additional Yuima package should be installed from the R Console with the command

```
install.packages("yuima", repos = "http://r-forge.r-project.org")
```

or, if it fails, with

```
install.packages("yuima", repos = "http://r-forge.r-project.org", type = "source")
```

Lectures will be based on the following books

- Iacus, S.M. (2011) *Option Pricing and Estimation of Financial Models with R*, John Wiley & Sons, Ltd., Chichester, 472 page, ISBN: 978-0-470-74584-7
- Iacus, S.M. (2008) *Simulation and Inference for Stochastic Differential Equations: with R examples*, Springer Series in Statistics, Springer NY, 300 pages, ISBN: 978-0-387-75838-1.

but extract of the parts relevant to the course, will be distributed during the lectures along with exercise sheets.