High Frequency Financial Econometrics using Matlab® – 2-day Course

This course provides an in-depth training in using Matlab in the analysis of high frequency financial data. Advances in computer power and data technology have led to the introduction of high frequency data. These data are vital in understanding issues pertaining to market microstructure noise, and permits the calculation of non-parametric intraday measures of variation that are superior to parametric measures based on daily data. The sheer size of this type of data often pause huge challenges to both researchers and practitioners. As such this course aims, using Matlab and state of the art high frequency data from TICKDATA database to highlight the best techniques and practices to overcome the empirical challenges of analyzing high frequency data.

General Objectives: To demonstrate the empirical techniques and methods employed to analyze high frequency data with special emphasis on the calculation of realized measures, forecasting and Monte Carlo methods and design.

Specific Objectives:

- Learn how to write efficient codes in Matlab.
- Be able to create your own functions in Matlab.
- Learn how to compute realized measures of volatility and generate forecasts
- Develop an understanding of the theoretical foundations and mathematical models of continuous / discontinuous time modeling.
- Monte Carlo Methods, Design and Implementation.

Day 1:

- Fundamentals of programming in Matlab
- Importing and exporting data
- Descriptive statistics and Density/log-density estimation
- Inter and intra-daily plots
- Time stamp, frequency conversion and data aggregation
- Data bases comparison Tick vs TAQ
- Data Types (Equity, Forex and Indices)

Day 2:

- Estimation of Quadratic Variation and its Components
- Stylized facts (Normality, persistence and noise)
- Intra-day periodicity
- Leverage effect
- Jump estimation and identification
- Forecasting using short and long memory specifications
- Monte Carlo Simulations