"Kdb+/q and Machine Learning in Finance (To boldly go where no man has gone before)"
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Abstract
In the first part of the talk, I will focus on kdb+/q. Kdb+ is a database built on top of an interpreter for a programming language, q. Kdb+/q, it is vector-based: vectors (arrays), rather than scalars, are the principal data types; scalar operations are implicitly generalised to higher-dimensional objects. It follows (some of) the functional programming paradigm with function being first class citizens. Usually the code lives right next to the data, so there is no need to spend time transmitting one to the other. Queries that do full table-scans (needing to visit every row) are common in analytical workloads. Row-major formats would require a full scan of the entire table, whereas the column-wise format allows one to read only the relevant columns making in incomparable to common languages like Python. The q programming language naturally lends itself towards the construction of terse and efficient code without loops. In the second part of the talk, I will focus on the machine learning algorithms from the perspective high-frequency time series domain, where long time series of tick data are to be analysed. I will discuss how to construct the major machine learning techniques literarily in few lines of code and run it on long time series data sets. Techniques like Lasso, Nearest Neighbour based algorithms, Neural Networks, Trees and Forests (including Deep Forests), or even Monte Carlo Tree Search (basis of famous AlphaGo and AIs) will be revisited.