



**Workshop 2019**  
**September 17-18, 2019, Amsterdam**

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**Title:** “Pricing and calibration with neural network in computational finance”

**Abstract:**

In this presentation, we will briefly outline the calibration of a financial asset price model in the context of financial option pricing.

We will explain the COS method, which is based on Fourier cosine expansions and the availability of the asset's characteristic function. We discuss particularly possibilities to perform fast and efficient option pricing, when a characteristic function is not available.

Particularly, to provide an efficient calibration framework, a data-driven approach, by means of an Artificial Neural Network (ANN), is proposed to learn the solutions of financial models and to reduce the corresponding computation time significantly.

This ANN-based method is extended to calibrate financial models. Specifically, fitting model parameters is formulated as training hidden neurons within a machine-learning framework.

The rapid on-line computation of ANNs combined with a flexible optimization method (i.e. Differential Evolution) provides us fast calibration without getting stuck in local minima.