Contribution ID: **143** Type: **not specified**

Deep Neural Network-Based Parameter Estimation of the Fractional Ornstein-Uhlenbeck Process

Tuesday, 12 September 2023 17:50 (20 minutes)

We present a novel deep neural network-based approach for the parameter estimation of the fractional Ornstein-Uhlenbeck (fOU) process. The accurate estimation of the parameters is of paramount importance in various scientific fields, including finance, physics, and engineering. We utilize a new, efficient, and general Python package for generating fractional Ornstein-Uhlenbeck processes in order to provide a large amount of high-quality synthetic training data. The resulting neural models significantly surpass the performance of state-of-the-art estimation methods for fOU realizations. The consistency and robustness of the estimators are supported by experiments. We believe that our work will inspire further research in the application of deep learning techniques for stochastic process modeling and parameter estimation.

Keywords

fractional Ornstein-Uhlenbeck process, deep neural network, parameter estimation

Classification

Mainly methodology

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Session Classification: CONTRIBUTED Finance

Track Classification: Finance