

I.E. Livieris and P. Pintelas. A novel multi-step forecasting strategy for enhancing deep learning models' performance. *Neural Computing and Applications*, 2022.



Abstract - Multi-step forecasting is considered as an open challenge in time-series analysis. Although several approaches were proposed to address this complex prediction problem, none of them could secure the development of an efficient as well as a reliable multi-step forecasting model. In this research , we present a novel strategy for the development of accurate, robust and reliable multi-step deep learning models. The proposed strategy is based on a sophisticated algorithmic framework, which is able to process, transform and deliver "high-quality" and "suitable" time-series training data. The suitability of the transformed data is secured by taking into consideration and exploiting the dynamics and the sampling of the time-series in conjunction with the forecasting horizon as well as the imposition of the stationarity property. The conducted numerical experiments performed on challenging real-world time-series datasets from the application domains: finance, commodity, climate and air quality, which demonstrate the efficacy, robustness and reliability of the proposed multi-step strategy.