



## Measuring Time Series Reversibility with Machine Learning

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**Christian Bongiorno**<sup>1,\*</sup>

1. Laboratoire Mathématiques et Informatique pour la Complexité et les Systèmes,  
CentraleSupélec, Paris, France

\* [christian.bongiorno@centralesupelec.fr](mailto:christian.bongiorno@centralesupelec.fr)

In statistical physics and time series analysis, "production entropy" is a key concept that describes the temporal irreversibility of dynamic processes. It measures how different a time series is from its time-reversed version. This measure is related to how predictable the series is. Interestingly, this can be linked to the capability of a regressor to tell apart a time series from its time-reversed version. This connection suggests that various machine learning methods, such as neural networks and gradient boosting, can be used to estimate production entropy. The seminar will examine synthetic models like the Browning gibrator to show the strengths and limits of these methods. Lastly, the seminar will discuss the application of these ideas to financial returns.

