# Article information:

Entropy | Free Full-Text | Neural Information Squeezer for Causal Emergence
<https://www.mdpi.com/1099-4300/25/1/26>

# Article summary:

1. Conventional studies of causal emergence have revealed that stronger causality can be obtained on the macro-level than the micro-level of the same Markovian dynamical systems if an appropriate coarse-graining strategy has been conducted on the micro-states.

2. This paper proposes a general machine learning framework called Neural Information Squeezer to automatically extract the effective coarse-graining strategy and the macro-level dynamics, as well as identify causal emergence directly from time series data.

3. The proposed framework can extract the coarse-graining functions and the dynamics on different levels, as well as identify causal emergence from data on several exampled systems.

# Article rating:

Appears well balanced: The article presents the information in a reliable and balanced way, without biases and prejudices. The claims made in the article are well supported and, where applicable, all sides of the argument are given opportunity to present their point of view. The article appears trustworthy and reliable.

# Article analysis:

The article is generally reliable and trustworthy in its claims and evidence presented. It provides a detailed overview of conventional studies of causal emergence, and presents a new machine learning framework for extracting effective coarse-graining strategies and identifying causal emergence from time series data. The article also provides examples of how this framework can be applied to various systems, demonstrating its potential utility in practice.

The article does not appear to contain any biases or one-sided reporting, nor does it contain any unsupported claims or missing points of consideration. All claims are supported by evidence, and all relevant points are discussed in detail. Furthermore, there is no promotional content or partiality present in the article; it is written objectively with both sides being presented equally. Additionally, possible risks associated with using this framework are noted throughout the article, providing readers with a comprehensive understanding of its potential implications.

# Topics for further research:

* Causal emergence theory
* Coarse-graining strategies
* Machine learning applications
* Time series data analysis
* Causal inference methods
* Complex systems modeling

# Report location:

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