Cornell University Library

We gratefully acknowledge support from the Simons Foundation and member institutions

arXiv.org > physics > arXiv:1305.6204

Search or Article-id

(Help | Advanced search)

All papers   Go!

Physics > Data Analysis, Statistics and Probability

Direct coupling information measure from non-uniform embedding

Dimitris Kugiumtzis

(Submitted on 27 May 2013)

A measure to estimate the direct and directional coupling in multivariate time series is proposed. The measure is an extension of a recently published measure of conditional Mutual Information from Mixed Embedding (MIME) for bivariate time series. In the proposed measure of Partial MIME (PMIME), the embedding is on all observed variables, and it is optimized in explaining the response variable. It is shown that PMIME detects correctly direct coupling, and outperforms the (linear) conditional Granger causality and the partial transfer entropy. We demonstrate that PMIME does not rely on significance test and embedding parameters, and the number of observed variables has no effect on its statistical accuracy, it may only slow the computations. The importance of these points is shown in simulations and in an application to epileptic multi-channel scalp EEG.

Download:

Current browse context:
physics.data-an

Change to browse by:

References & Citations

- NASA ADS

Bookmark(what is this?)