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Akaike causality in state space. Instantaneous causality between visual cortex in fMRI time series. (English) Zbl 1122.92044

Biol. Cybern. 97, No. 2, 151-157 (2007).

Summary: We present a new approach of explaining instantaneous causality in multivariate fMRI time series by a state space model. A given single time series can be divided into two noise-driven processes, a common process shared among multivariate time series and a specific process refining the common process. By assuming that noises are independent, a causality map is drawn using Akaike's noise contribution ratio theory. The method is illustrated by an application to fMRI data recorded under visual stimulation.

MSC:

92C55 Biomedical imaging and signal processing

Keywords:

Akaike causality; noise contribution ratio; state space model; latent variable; instantaneous causality

Full Text: DOI

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