

Pattern recognition beyond classification: an abductive framework for time series interpretation

Título Pattern recognition beyond classification: an abductive framework for time series interpretation

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Tipo Tese doutoral

Data de lectura 28/04/2017

Lugar de lectura Universidade de Santiago de Compostela

Doutorado Doutorado europeo


Abstract Time series interpretation aims to provide an explanation of what is observed in terms of its underlying processes. The present work is based on the assumption that the common classification-based approaches to time series interpretation suffer from a set of inherent weaknesses, whose ultimate cause lies in the monotonic nature of the deductive reasoning paradigm. In this thesis we propose a new approach to this problem, based on the initial hypothesis that abductive reasoning properly accounts for the human ability to identify and characterize the patterns appearing in a time series. The result of this interpretation is a set of conjectures in the form of observations, organized into an abstraction hierarchy and explaining what has been observed. A knowledge-based framework and a set of algorithms for the interpretation task are provided, implementing a hypothesize-and-test cycle guided by an attentional mechanism. As a representative application domain, interpretation of the electrocardiogram allows us to highlight the strengths of the present approach in comparison with traditional classification-based approaches.

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 Teseo

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