Complexity Community Talk

Probabilistic Modeling of Complex Systems with Information-Filtering Networks

Date: 18 Oct 2018 (Thu)
Time: 3:00 PM to 4:00 PM
Venue: Complexity Institute, Nanyang Technological University

Speaker: Prof. Tomaso Aste
Department of Computer Science, University College London

Abstract

We are all flooded with data. Filtering such data-flow to extract useful information and build functional models of the underlying system has become a major activity across science, industry and society at large. Networks are excellent tools to represent and model complex systems such as the human brain or financial markets. Sparse networks constructed from observational data can be used to filter information by extracting the core interaction structure in a simplified but representative way.

In my talk, I will show how information-filtering networks built from dependency measures, both linear and non-linear, can be used to process information while it is generated reducing complexity and dimensionality while keeping the integrity of the dataset. I will describe how predictive probabilistic modeling can be associated to such networks. Applications to financial systems, psychometric, and genetic studies will demonstrate how reliable, predictive and useful these models are.

Biography

Tomaso Aste is Professor of Complexity Science at UCL Computer Science Department. A trained Physicist, he has substantially contributed to research in complex structures analysis, financial systems modelling and machine learning. He is passionate in the exploration of the interface between technologies on society and currently he focuses on the application of Blockchain Technologies to domains beyond digital currencies.

He is Scientific Director and Founder of the UCL Centre for Blockchain Technologies, Head and Founder of the Financial Computing and Analytics Group at UCL, Programme Director of the MSc in Financial Risk Management, Vice-Director of the Centre for doctoral training in Financial Computing & Analytics, and Member of the Board of the ESRC LSE-UCL Systemic Risk Centre.

Prior to UCL he held positions in UK and Australia. He is advising and consulting for financial institutions, banks and digital-economy companies and startups.

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