Informatics Research
Institute of Toulouse

Tuesday 23 February 2016
13h30 – 15h30
UT3 Paul Sabatier, IRIT, Auditorium J. Herbrand

Cédric FÉVOTTE
CNRS, Observatoire de la Côte d'Azur & Université Nice Sophia Antipolis (France)

Nonnegative matrix factorisation and some applications in audio signal processing

Seminar

Abstract: Data is often available in matrix form, in which columns are samples, and processing of such data often entails finding an approximate factorisation of the matrix in two factors. The first factor (the "dictionary") yields recurring patterns characteristic of the data. The second factor ("the activation matrix") describes in which proportions each data sample is made of these patterns. In the last 15 years, nonnegative matrix factorisation (NMF) has become a popular technique for analysing data with non-negative values, with applications in many areas such as in text information retrieval, hyper-spectral imaging or audio signal processing. In the latter area, NMF has been applied with success to automatic music transcription, speech enhancement or source separation, in particular in the difficult single-channel scenario. In this setting the nonnegative data is the spectrogram of the sound signal and the dictionary captures spectral patterns representative of the data. The presentation will give an overview of NMF and will describe audio source separation & restoration applications.

Short bio: Cédric Févotte is a CNRS senior researcher at Laboratoire Lagrange (CNRS, Observatoire de la Côte d'Azur & Université Nice Sophia Antipolis). Previously, he has been a CNRS researcher at Télécom ParisTech (2007-2013), a research engineer at Mist-Technologies (the startup that became Audionamix) and a postdoc at University of Cambridge (2003-2006). He holds MEng and PhD degrees in EECS from École Centrale de Nantes. His research interests concern statistical signal processing and machine learning, for inverse problems and source separation. He is a member of the IEEE Machine Learning for Signal Processing technical committee and an associate editor for the IEEE Transactions on Signal Processing. In 2014, he was the co-recipient of an IEEE Signal Processing Society Best Paper Award for his work on audio source separation using multichannel nonnegative matrix factorisation.

Web page: http://www.unice.fr/cfevotte/

05 61 55 65 10
info@irit.fr
www.irit.fr

Organized by
Department SI - Team SC