Informatics Research
Institute of Toulouse

Within the framework of
ERC FACTORY

Tuesday 16 October 2018
17h00 – 18h00
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Pierre ABLIN
INRIA Paris

Fast and invariant learning for Independent Component Analysis

Seminar

Abstract: Independent Component Analysis (ICA) is a widely used unsupervised data exploration technique. It models a set of observed signals as a linear mixtures of statistically independent sources and aims at recovering blindly those underlying sources. Here `blind' means that sources are recovered from the signals by applying a separating matrix which is totally inconstrained, making ICA applicable in a large variety of tasks.

After a brief introduction, we introduce a fast quasi-Newton algorithm for ICA, the Preconditioned ICA for Real Data (Picard) algorithm. It exploits the specific structure of the problem to compute cheap Hessian approximations, and then refines them using L-BFGS, a classical optimization algorithm. It shows state of the art convergence speed when applied to real datasets. Interestingly, it can be straightforwardly constrained to work on the rotation manifold, a constraint often imposed in ICA.

Short Bio: Pierre is a 3rd year Ph.D. student at INRIA in the Parietal team. He is supervised by Alexandre Gramfort and Jean-François Cardoso. The topic of his Ph.D. is independent component analysis with an emphasis on its application to brain signals. His subjects of interest include non-convex optimization, statistical learning theory and matrix factorization.

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

Organized by
Department SI - Team SC