PhD position in Machine Learning algorithms for learning representations from temporal data

Title: Learning representations from multivariate temporal data
Duration: 3 years
Starting date: September 2015
Funding: Gross salary about 2000 euros/month, Projet Investissement d'Avenir IKATS
(partners: CS, AIRBUS and EDF-R&D)
Supervisors: Ahlame Douzal, Eric Gaussier

Description
Supervised or unsupervised classification of multivariate time series arise in a natural way in a lot of domains, especially in emerging applications such as sensor networks, social networks, smart buildings or Internet of things.

In real applications, temporal data originating from the same sources or measuring the same phenomenon are often noisy and tend to have extremely variable timing of their salient features. Temporal features may be irregular with dependencies that evolve in nature and on time. Finally, temporal data may exhibit extremely different global behaviors while sharing latent local features.

Many machine learning algorithms are available to learn deep hierarchies and representations from structured data, principally from images. This thesis will address the problem of learning latent representations from multivariate temporal data. For this, we propose to study new approaches and algorithms that rely on unsupervised feature learning and learning metrics to extract latent representations pertinent for multivariate time series classification and clustering. According to the nature of the data, the proposed approaches should be i) scalable and ii) allow efficient reconstructions of multivariate time series (i.e. the pre-image estimation). The research done will be applied on aeronautic and energy data from two "end-users" AIRBUS and EDF R&D.

Required skills
- Machine learning, algorithmic, statistics, linear algebra, optimization.
- Fluency in English is important

Application
The application should include a brief description of research interests and past experience, a CV, degrees and grades, relevant publications, and any relevant documents. Candidates are encouraged to provide contact information to reference persons (for more details see http://ama.liglab.fr/jobs/).
Please send your application in one single pdf to ahlame.douzal@imag.fr

Working Environment
The PhD candidate will work at AMA team (http://ama.liglab.fr/) of the LIG lab at Grenoble, France. Grenoble is the capital of the Alps in France, with excellent train connection to Geneva (2h), Paris (3h) and Turin (4h). AMA team is a dynamic group working in Machine Learning and Data Analysis domains over 20 researchers (including PhD students) and that covers several aspects of machine learning from theory to applications, including statistical learning, data-mining, and cognitive science.