PhD position in Data Analysis and Machine learning for spatio-temporal data

Title: Learning representations for classification, cokriging and forecasting spatio-temporal data
Duration: 3 years
Starting date: September 2016
Funding: Gross salary about 2000 euros/month (LOCUST ANR Project)
Partners: MLIA-LIP6 UPMC, DEEZER

Description
Human interactions conducted either via the web and mobile services, or with artifacts, moving objects, and intelligent sensors generate large flows of complex dynamic data. These user traces correspond to sequences of observations: events, measurements, semantic content, etc. They may have a space (e.g. geo-localization) and temporal components that are often composed of multiple types of information. The PhD position fits within the Locust project, the objective of which is to build formal models and algorithmic tools aimed at understanding, modeling and analyzing complex dynamic traces (spatio-temporal data) for a set of generic machine learning tasks and for target applications. Two use cases concerning respectively semantic information diffusion and urban computing will support the theoretical contributions and serve for evaluating the models and algorithms. The project is research oriented with two academic and an industrial partner (DEEZER).

More particularly, the PhD candidate will address the problem of learning representations [1, 2] for classification, cokriging and forecasting of spatio-temporal data. Spatio-temporal data correspond to multivariate time series spatially localized and arising from a multi-source diffusion process. For representation learning, we will mainly investigate approaches and models that account for dependencies related to variables, time and space [3], in a tractable and scalable way with guaranteed derivability and optimization properties. All the models developed will be implemented and tested on real and large datasets (both existing ones as well as new ones developed within the project).

Required skills
- Machine learning, computer science, 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. Please send your application in one single pdf to ahlame.douzal@imag.fr, Eric.Gaussier@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 (3h). AMA team is a dynamic group working in Machine Learning and Data Analysis with over 25 members (both permanent and PhDs/postdoctorates). The research of the team covers several aspects of machine learning, from theory to applications, including statistical learning, data-mining, and cognitive science.

References