Postdoctoral Opportunity: Sparse supervised learning

Context and methodology

This postdoctoral position takes part in a TOTAL research project aiming to develop new predictive model for special fuel manufacturing. Each product may have both a molecular signature, obtained by chromatographic analysis, and physicochemical properties. The main objective of this post-doctoral position is to establish links between both quantities by means of supervised learning techniques. This objective can come in two axes : (i) selection of an informative sample of observations among massive set of observations and (ii) selection of an informative small subset of variables among a large data set.

Preliminary studies have been done in order to test the reliability of sparse supervised learning (sparse regression, sparse SVM,...). The objective of this post-doctoral position is thus dedicated to develop both new models and new algorithms in order to improve the existing predictive model. Moreover, in order to select observations of interest, we will focus on recent developments on active learning using submodular informative criteria. The theoretical results could be published in international conferences and journals.

Applicant profile

Candidates should have a strong background in supervised learning, optimization, a good publication record and experience in programming (using MATLAB, Python –scikit-learn– or C). Proficiency in English (oral and written) is essential, as well as scientific writing skills.

Applicants should send a CV, including list of publications and a description of previous research experience, as well as the names and addresses of two academic referees, to: **Dr. N. Pustelnik** (nelly.pustelnik@ens-lyon.fr), **Dr. S. Janaqi** (Stefan.Janaqi@mines-ales.fr) and **Dr. M. Chebre** (meriam.chebre@total.com).

Conditions

- Date: January 2016,
- Contract: 12 months (could be extended to 6 months according to the results obtained during the first year period),
- Situation: Laboratoire de Physique ENS de Lyon,
- Salary: Related to experience.

References

[1] F. Bach, R. Jenatton, J. Mairal, and G. Obozinski, "Optimization with sparsity-inducing penalties," *Foundations and Trends in Machine Learning*, vol. 4, no. 1, pp. 1–106, 2012.

[2] G. Chierchia, N. Pustelnik, J.-C. Pesquet, and B. Pesquet-Popescu, "A proximal approach for sparse multiclass SVM," http://arxiv.org/abs/1501.03669, Dec. 2014.

[3] S. Burr, "Active Learning Literature Survey," Computer Sciences Technical Report 1648, University of Wisconsin Madison, updated on January 26, 2010.