Student Project Proposal – SPRING 2016

Project Title: Deep Gaussian Processes

Track: Data Science
Semester: SPRING 2016
Number of students: 1
Supervisor(s): Maurizio FILIPPONE

Gaussian Processes are widely used in applications of data analysis due to their flexibility to model functional relationships between variables. When the functional relationship between variables has a position dependent degree of smoothness (it is nonstationary), traditional Gaussian Processes fail. One way to tackle these problems is to compose Gaussian Processes by stacking one on top of another (the output of one Gaussian Process is fed as input to another Gaussian Process thus creating a deep architecture). Deep Gaussian Processes are much more flexible compared to standard Gaussian Processes and can cope well with nonstationarity. However, their training becomes extremely difficult from a computational point of view.

The aims of this project are:
- to study and implement current (approximate) techniques to train deep Gaussian Processes;
- to develop novel ways to infer parameters of deep Gaussian Processes based on approximate and Markov chain Monte Carlo methods;