Machine Learning algorithms, methods and theory
Proposed project for MISCADA

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Description

The project includes the study, and modification of recent developments in machine learning algorithms and methods with a statistical/mathematical perspective. The project involves the study of modern mathematical techniques that are commonly used to analyze machine learning algorithms in the current literature. It focuses on the theory and rigorous analysis of machine learning algorithms aiming to address problems that involve big data sets, high-dimensional data sets / models, and others. Possible implementation involve prediction, classification, and clustering problems.

Potential project directions

Potential directions for the project/dissertation can be: Stochastic Gradient Descent and variations, Stochastic Gradient MCMC methods (e.g. SGLD, SG Hamiltonian Monte Carlo, etc), mathematical analysis of ML algorithms, Kernel methods, online learning, regularization for small n large d problems, and others.

Project specific intended learning outcomes

By the end of this project, students will be able to design, analyse, and implement suitable machine learning methods. You will be exposed to rigorous design and analysis of machine learning algorithms and methods.

Requirements

Knowledge of Bayesian Statistics, and Regression. Knowledge of R or Python. Also it is required a basic mathematical knowledge of calculus, linear algebra, and probability, as well as sufficient mathematical maturity to follow rigorous theoretical proofs.

Contact details

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