Projects

9.520

2010
Projects

1. Implement and test a large-scale regularization algorithm. Papers? [L/T,CF]

2. Parameter tuning for dimensionality reduction in terms of bias-variance trade-off. [L]

3. Find a way to formalize and exploit dependence among related learning tasks (multi-output kernel learning, statistical techniques). [L]
Why Reproducing Kernel Hilbert Spaces are a natural set of hypothesis spaces for supervised learning? Draw ideas from embedding theorems, extension to Banach spaces having in mind sparsity based regularization.[TP, L, CF]

Review-type projects

3. Review: Learning from non i.i.d. data.
5. Review: Learning on Graphs.
7. Write/edit (create account first) entries for Wikipedia (eg Regularization Networks, Radial Bases Functions, Learning Theory, RKHS, Generalization Bounds, Stability in Learning)
iPhones machine learning applications!
1. Computational biology: inferring gene regulatory networks from large genomics datasets. Could explore supervised and/or semi-supervised methods. Will probably confront variable selection problems – how to choose from amongst many candidate explanations for the data? [CF]

2. Various projects on the visual cortex model are available. These projects will typically require more time but may also lead to some paper.

3. Experiments with derived kernels. Developing existing code. Use CNS (GPU-based).