

Projects Proposals

MIT: 9.520

2012

Projects Type

The final project can be either a wikipedia entry or a research project (we recommend a Wikipedia entry).

Wikipedia

For the Wikipedia article, we suggest a short one using the Wikipedia standard article format; for the research project you should use this template. Reports should be 8 pages maximum, including references. Additional material can be included in the appendix.

Research Projects

We envision 2 kinds of research project:

- Applications: evaluate an algorithm on some interesting problem of your choice;
- Theory and Algorithms: study theoretically or empirically some new machine learning algorithm/problem.

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Possible Wikipedia Projects

- Machine Learning!!!!
- Statistical learning theory!!!!
- Regularization!!! (regularized learning algorithms).
- Regularized Least Square in Learning Theory.
- Stability of Tikhonov Regularization.
- Regularization perspectives on SVM.
- Generalization error and bounds.
- RBF Networks.
- RKHS.
- ...

Possible Research Projects

- Large Scale Learning with GURLS (Andrea Tacchetti, LR)
 - Non linear kernel approximations, e.g. random features.
 - Spectral filtering, early stopping, TSVD.
 - Randomized SVD solver.
 - ...
- Regularization parameter choice: theory algorithms applications (LR).
- Evaluating which classifiers work best for decoding neural data (Ethan Meyers)
- Experiments with derived kernels. Developing existing code. Use CNS (GPU-based) (AT, LR, TP).

Possible Research Projects

- HyperBF: review and formulate Bayesian equivalent formulation; also greedy optimization for HyperBF (TP).
- Project fly and Bayes (TP).
- Psychophysics: ask people what they see in images flashed for 20msec– without mask (JL).
- Can a learning algorithm be devised to replace NSF review panels?