CIS 242 | Machine Learning
Winter 08 | Warmuth
handed out Th 1-10-08

Homework Assignment 1

due Th-17-08, beginning of class

The goal of this homework is to get you familiar with the Shifting Expert Framework and Matlab. You are to implement some on-line learning algorithms and plot various performance curves.

Base task:

Implement the disk idle time prediction algorithms given in original paper (see link for Lecture 2).

Plot the total energy usage of the master algorithm, the individual experts, and the optimal algorithm.

Plot the weights of the experts over time.

Summarize your results in a short report. In particularly, carefully describe you plots and brainstorm on how to extent your algorithms.

Besides the base task you should do at least one of the following:

- Study the effects of using different sets of fixed time outs as experts and different learning rates
- Try different share updates (Fixed share to start vector / fixed share to uniform past /fixed share to decaying past / variable share updates).
- In the original paper each expert is a fixed time out strategy. Use other simple rules of thumbs as experts
- Make up artificial data sets (As in the [BW] paper) to study the effects of different share updates
- Any other idea you might have

Be sure to visualize your results and remember, presentation is what counts.

The data will be accessible via a link of the webpage. We also provided some good initial parameter settings for your algorithms in the talks.

Begin by reading the original Spin Down paper and "Shifting Expert's" papers as much as possible.

You can brainstorm with others but must do your own experiments and report