Course mini-project: detailed instructions and grading scheme

Format of the competition.

At (roughly) 12:15 PM, we will send you a .mat file containing:

- an $M \times N$ matrix X
- a length M column vector $\underline{y}$
- another $M_{test} \times N$ matrix X_{test}

Your task is then to find, using simulated annealing, a vector $\underline{w} \in \{-1, +1\}^N$ such that the energy

$$E(\underline{w}) = \frac{1}{2} \sum_{\mu=1}^{M} (y_\mu - \text{sign}(\underline{x}_\mu^T \, \underline{w}))^2$$

is the lowest (where $\underline{x}_\mu$ denotes the μ-th row of the matrix X). Then we also ask you to compute the vector

$$y_{test,\mu} = \text{sign}(\underline{x}_\mu^T \, \underline{w}), \quad \mu = 1, \ldots, M_{test}$$

Finally, you should return to us, after 30 minutes:

- the vector $\underline{w}$ of length N (in matlab *column* vector format)
- the corresponding energy $E(\underline{w})$
- the vector $\underline{y}_{test}$ of length M (in matlab *column* vector format)

Please put all this in a file "answer_TEAM_NAME.mat"
(in matlab: save('answer_TEAM_NAME.mat','w','E','ytest');)

The team(s) with the lowest energy and/or the least number of errors on the test set wins.

Grading scheme.

The midterm is worth 20 points (=20%) in total.

The project (code+report) is also worth 20 points (=20%) in total.

The final exam will be worth 60 points (=60%) in total.

Besides, the winners of the competition (which will take place on Thursday at 12:15 PM) will earn 5 extra points.