COM500 Mini-Project:
Adaptive Filtering

Goals of the Mini-Project

Each mini-project proposes to examine in deep one of the statistical signal and data processing tools seen in class.

The general tasks to be executed are:

- Implement the assigned tool (Python or Matlab);
- Test it on simulated and real data (real data will be provided);
- Consult the suggested literature for another tool, not presented in class, outperforming the assigned tool;
- Implement the new tool (Python or Matlab);
- Prepare a demo (on simulated and real data) comparing the two tools;
- Prepare about 5 slides to present to your colleagues the tools, their comparison, and a demo.

You will be evaluated on these tasks.

Description of the Mini-Project

Adaptive filtering copes with signals with time varying properties and perfectly fits to echo cancellation and denoising problems. Its main implementation constraint is to be (almost) real time.

For this mini-project, it is interesting to

- Implement an "off line" adaptive denoising algorithm.
- Implement an "on the fly" adaptive denoising algorithm.

References:

- V.K. Ingle, J.G. Proakis. *Digital Signal Processing Using MATLAB*. CL Engineering, 2011.
- P.M. Clarkson. *Optimal and Adaptive Signal Processing*. CRC Press, 1993.