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SwAMP Demo User's Manual

Using this demo is supposed to be straightforward: one needs only to open Matlab, go to the current folder and run the command `demo`.

When the demo starts, a compilation will take place. SwAMP is written in C and must be compiled using Matlab's MEX API. If you have a C compiler on your computer, everything should (hopefully) go smoothly! We have tested the compilation using `gcc` in different platforms, but we'd expect it to work with other compilers as well. Make sure to run `mex -setup` if you have no previously used Matlab's MEX feature.

If you have problems, you can try the Python version which, in spite of being much slower, achieves the same results.

Key Reference

A. Manoel, F. Krzakala, E. W. Tramel, L. Zdeborovà, "Sparse Estimation with the Swept Approximated Message-Passing Algorithm," *arXiv submitted.*

Contributors to this Repository

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A few details

- The demo script calls functions from the the `examples` folder. By exploring these, one may get a better grasp of how to use SwAMP.

- SwAMP's source code is located on the `src` folder; in particular, the bulk of the algorithm is contained in the `src/solvers/amp.c` file. This version follows exactly the listings in the paper, and is already optimized to work with sparse matrices. Additionally, 3 other versions are present in the same folder:
  - `gamp.c`, which implements G-SwAMP;
  - `amp_dense.c`, a version that isn't optimized for sparse matrices;
  - and `amp_alt.c`, a slight modification of the algorithm that, in spite of reaching the same results, sometimes converges faster.

Trouble Shooting (Mac)

- Some distributions of MacTeX include a binary named `mex` which is generally located in your `/usr/texbin` directory. This may cause some issues if this is your first time building with Matlab's MEX compiler. Make sure that your Matlab binary directory is included at the *front* of your environment PATH. For example, when using MATLAB 2013b, the following lines would be added to the user's `.bashrc` or `.bash_profile`,

```
PATH=/Applications/MATLAB_R2013b.app/bin:$PATH
export PATH
```