April 8, 2024

ACM Transactions on Mathematical Software

Dear Editors:

We submit our algorithm paper "covdepGE: a Covariate-Dependent Approach to Gaussian Graphical Modeling in R" to *ACM Transactions on Mathematical Software*. The manuscript describes our R package `covdepGE`, available on CRAN.

In this package, we implement a framework introduced in a previous work for Gaussian graphical modeling in the setting where the data distribution varies continuously with an extraneous covariate. We extend this work by proposing and providing automated and data-driven hyperparameter specification strategies. For efficient inference, we enable parallelism and integrate C++ with R. In a simulation study spanning diverse settings, we compare our package to 2 packages that are representative of the currently available methods for graphical modeling in the regime of non-identically distributed data.

Our submission items are organized as follows.

1. **Main Document**: our algorithm paper.
2. **Algorithm**: a zip file that contains:
    - **Algorithm Implementation** in the directory `source`. This directory also contains a Unix-style `makefile` for installing R, installing package dependencies, and building our package from the source code.
    - **Example Driver** in the directory `example_driver`, which contains `example.R` and a model set of results, `example.pdf`.
    - **Testing Material** in the directory `testing_material`, which contains `test.R` and four `.Rout` files containing the expected results for two different settings ($p = 10$ and $p = 25$), each run on Windows and Linux.
    - **Documentation** in the file `docs.pdf`.
    - Latex files for building the **Documentation** in the folder `latex_manual`. `Rd.tex` compiles without error on Overleaf with `Rd2.sty`.
    - All scripts necessary for reproducing all results and analysis presented in our paper in the directory `simulation_study`.
3. **Supplemental Files**: a zip file containing three documents:
    - A copy of this table of contents for reviewers in the file `README.pdf`.
    - Evidence of **portability** in the file `portability.pdf`.
    - The previous work on which our package is based in the file `graph_learning.pdf`. This manuscript is currently under review.

Sincerely,

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