

# User Manual

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*The current version of all files is V.5.0.*

## 1 Description of files

The full package contains 5 important files:

- **arma\_func\_v.x.x.R** – contains functions for estimating ARMA-family models using LASSO, MCP, SCAD, and ALASSO penalties.
- **arma\_sim\_v.x.x.R** – provides code for Monte-Carlo simulations using penalized ARMA models.
- **arma\_res\_v.x.x.R** – aggregates the results all together for all designs.
- **des\_full.RData** – this data file contains the results of simulations (for all designs).
- **des\_i.RData** – additional files containing results for each specific design  $i \in \{1, \dots, 21\}$ .

## 2 Names of objects in the file with results

This section explains the names of objects in the `arma_res_v.x.x.R` file.

- **seed\_i** – the vector of seed values for every design, where  $i$  stands for the number of the design.
- **theta\_hat\_lasso\_i** – the list of parameter estimates for lasso penalty, i.e.,  $\hat{\theta} = (\hat{\beta}, \hat{\pi})$ , the value of the maximized objective function, and the value of  $BIC$  for each  $\lambda$  across every design
- **theta\_hat\_mcp\_i** – the list of parameter estimates for MCP penalty, i.e.,  $\hat{\theta} = (\hat{\beta}, \hat{\pi})$ , the value of the maximized objective function, and the value of  $BIC$  for each  $\lambda$  across every design.
- **theta\_hat\_scad\_i** – the list of parameter estimates for SCAD penalty, i.e.,  $\hat{\theta} = (\hat{\beta}, \hat{\pi})$ , the value of the maximized objective function, and the value of  $BIC$  for each  $\lambda$  across every design.
- **theta\_hat\_lasso\_i** – the list of parameter estimates for alasso penalty, i.e.,  $\hat{\theta} = (\hat{\beta}, \hat{\pi})$ , the value of the maximized objective function, and the value of  $BIC$  for each  $\lambda$  across every design.
- **theta\_hat\_max\_lasso\_i** – the vector of parameter values for lasso penalty corresponding to the smallest  $BIC$ , i.e.,  $\hat{\theta}_{max}$ , the value of the maximized objective function, and the value of  $BIC$ .
- **theta\_hat\_max\_mcp\_i** – the vector of parameter values for MCP penalty corresponding to the smallest  $BIC$ , i.e.,  $\hat{\theta}_{max}$ , the value of the maximized objective function, and the value of  $BIC$ .
- **theta\_hat\_max\_scad\_i** – the vector of parameter values, i.e.,  $\hat{\theta}_{max}$ , for SCAD penalty corresponding to the smallest  $BIC$ , the value of the maximized objective function, and the value of  $BIC$ .
- **theta\_hat\_max\_lasso\_i** – the vector parameter values for alasso penalty corresponding to the smallest  $BIC$ , i.e.,  $\hat{\theta}_{max}$ , the value of the maximized objective function, and the value of  $BIC$ .

- **accuracy\_lasso\_i** – the number representing the share of simulations when  $\hat{\beta} = 0$  for lasso penalty, where  $i$  defines the design.
- **accuracy\_mcp\_i** – the number representing the share of simulations when  $\hat{\beta} = 0$  for MCP penalty, where  $i$  defines the design.
- **accuracy\_scad\_i** – the number representing the share of simulations when  $\hat{\beta} = 0$  for SCAD penalty, where  $i$  defines the design.
- **accuracy\_lasso\_i** – the number representing the share of simulations when  $\hat{\beta} = 0$  for alasso penalty, where  $i$  defines the design.