INTEREST: INteractive Tool for Exploring REsults from Simulation sTudies

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Why?

- Simulation studies are an invaluable tool used for answering a plethora of questions, such as: is an estimator biased in finite samples? Does a new method perform better than an established one? What happens if some assumptions are violated?

- Simulation studies are the only possible way to fully assess statistical methods: you can generate data from a known truth, and compare different methods in how they perform in estimating it

- It is nowadays easy and computationally cheap to run simulation studies under lots of different scenarios

- Dissemination of results is key, but it can get cumbersome with many simulated scenarios; reporting guidelines have been emerging recently

- ADMEP framework to harmonise reporting of simulation studies[1]: Aims, Data-generating mechanisms, Methods, Estimands, and Performance measures

What?

- Sometimes reporting guidelines are not enough with lots of results. Interactive tools can supplement ADMEP effectively

- INTEREST (INteractive Tool for Exploring REsults from Simulation sTudies) is an interactive web app developed using R and the Shiny package[2]

- INTEREST is fully self-contained, it does not require installing R and works on any browser - even on phones and tablets!

Do you want to try out INTEREST?

A beta version with instructions on how to install it on a local machine is available at https://goo.gl/kvLyhP. Scan the QR code for quick access.

Feedback is much appreciated!

Is there something you would like INTEREST to do? Please e-mail or open issues on GitHub. Pull requests are also encouraged!

Workflow of INTEREST

Upload your data

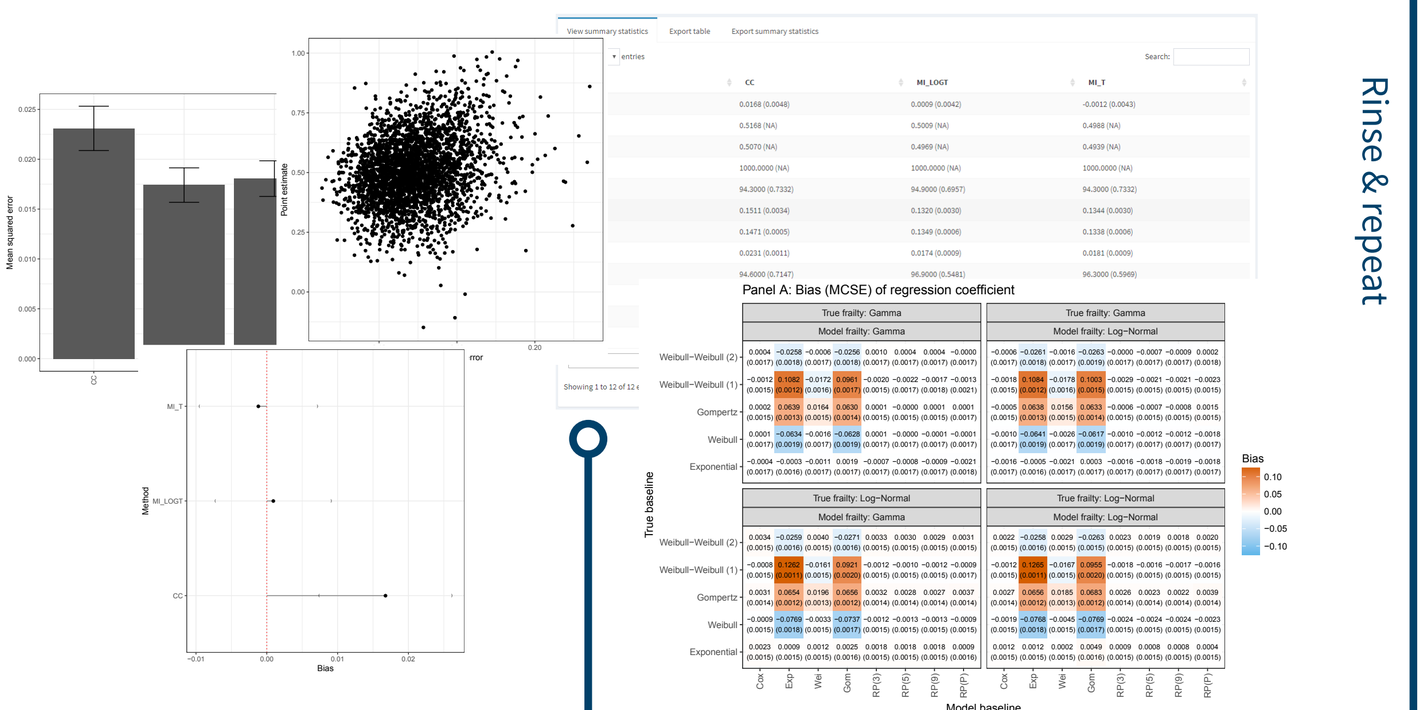
- Upload a dataset with your simulation study results to INTEREST; a variety of formats are supported: comma-separated values, R/Stata/SAS/SPSS datasets, ...
- Define variables representing point estimates, standard errors, methods compared, data-generating mechanisms

Step 1: Vary data-generating mechanisms

- Controls are populated automatically
- A variety of summary statistics are computed automatically, including Monte Carlo standard errors[3]
- Modify data-generating mechanisms, and summary statistics are updated: all computations are on the fly

Step 2: Explore results

- Plots and tables for summary statistics are produced automatically, and immediately updated when data-generating mechanisms are modified
- A variety of plots are available: barplots, point estimates vs standard errors plots, lolly plots, heatmaps, ... and many more to add!



Step 3: Export summaries

- Tables can be exported as a dataset for further processing with your favourite tools, or exported in LaTeX format
- Plots can be customised (axis labels, faceting, ...) and exported in PNG or PDF format, using user-defined size and resolution

Rinse & repeat

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References:

[1] IR White, T Morris, and MJ Crowther. *Tutorial in biostatistics: using simulation studies to evaluate statistical methods.* Under review.

[2] https://shiny.rstudio.com/

[3] IR White. *simsum: Analyses of simulation studies including Monte Carlo error*. 2010, The Stata Journal, 10(3):369-385