mimosa: A Modern Graphical User Interface for 2-level Mixed Models

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Summary

The mixed models special agent (mimosa) is a shiny (Chang, Cheng, Allaire, Xie, & McPherson, 2019) app for 2-level mixed models. Mixed models are rapidly becoming the gold standard of statistical analysis techniques in the behavioral sciences. Yet there is only a small number of user-friendly programs for conducting mixed model analyses. The most common tools often lack a graphical user interface, are proprietary, and involve a tedious process of getting data in and publication-ready tables out. An exception is the shiny app mimosa which offers an alternative that is free, open source, intuitive, and runs in a browser, making it easily accessible (see https://www.mimosa.icu).

The software is targeted at behavioral scientists who frequently use 2-level mixed models and want a solution that is tailored for this particular use case. For instance, researchers studying groups (e.g. students clustered in schools, individuals clustered in work groups) and researchers employing within-subjects designs almost exclusively analyze their data with 2-level mixed models. Unlike other software, mimosa was designed for this use case. It helps the analyst by automatically detecting potential grouping variables and categorizing these variables in level 1 and level 2. Furthermore, mimosa is researcher-oriented because it produces a single summary table via sjPlot (Lüdecke, 2018) that can be published in a scientific journal without any modifications.

To my knowledge, there are only a couple of free, open source, software packages for mixed models that have a graphical user interface. For a slightly outdated comparison of different mixed model software (including proprietary and command-line software) see West & Galecki (2012). LMMgui focuses on within-subjects-designs and as such can be seen as a direct competitor of mimosa. LMMgui offers diagnostic plots and can compare two models, which is missing in mimosa. The disadvantage of LMMgui is that it is only available for Windows, while mimosa runs on any platform because it is a browser application. Furthermore, mimosa has a cleaner interface, is easier to use, and produces a publication-ready output.

The GAMLj (Gallucci, 2020) module for jamovi (The jamovi project, 2019) is a more comprehensive tool for mixed model analysis. It is possible to model more than two levels and specify more complex models in general. GAMLj’s functionality is close to the command line interface of lme4 (Bates, Mächler, Bolker, & Walker, 2015). This is a clear benefit, but it also comes with a downside: GAMLj’s interface is less clean than mimosa’s. GAMLj has many dialogues and the specification of a model is not as intuitive as in mimosa. Still, GAMLj is an almost perfect software for mixed models in general. On the other hand, mimosa follows the idea of doing one type of analysis well, which is the one that many behavioral researchers do most of the time: 2-level mixed models.

In contrast to the software packages I am aware of (including the ones discussed by West & Galecki (2012)), mimosa is the only one that runs in a browser. While this might be seen as a trivial advantage, it has clear benefits. There is no need to install or update mimosa or its
dependencies, and the application can be used at any place with an internet connection—for instance, at the office of a colleague who does not have jamovi and GAMLj installed, in the classroom, or at a conference presentation for a live analysis.

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References


