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References

Boettiger et al.: An introduction to Rocker: Docker containers for R

Boettiger-Eddelbuettel-2017

Carl Boettiger and Dirk Eddelbuettel. “An introduction to Rocker: Docker containers for R”. In: *The R Journal* 9.2 (2017), p. 527. DOI: [10.32614/rj-2017-065](https://doi.org/10.32614/rj-2017-065).

Abstract: We describe the Rocker project, which provides a widely-used suite of Docker images with customized R environments for particular tasks. We discuss how this suite is organized, and how these tools can increase portability, scaling, reproducibility, and convenience of R users and developers.

Deboeck et al.: No Need to be Discrete: A Method for Continuous Time Mediation Analysis

Deboeck-Preacher-2015

Pascal R. Deboeck and Kristopher J. Preacher. “No Need to be Discrete: A Method for Continuous Time Mediation Analysis”. In: *Structural Equation Modeling: A Multidisciplinary Journal* 23.1 (June 2015), pp. 61–75. DOI: [10.1080/10705511.2014.973960](https://doi.org/10.1080/10705511.2014.973960).

Abstract: Mediation is one concept that has shaped numerous theories. The list of problems associated with mediation models, however, has been growing. Mediation models based on cross-sectional data can produce unexpected estimates, so much so that making longitudinal or causal inferences is inadvisable. Even longitudinal mediation models have faults, as parameter estimates produced by these models are specific to the lag between observations, leading to much debate over appropriate lag selection. Using continuous time models (CTMs) rather than commonly employed discrete time models, one can estimate lag-independent parameters. We demonstrate methodology that allows for

continuous time mediation analyses, with attention to concepts such as indirect and direct effects, partial mediation, the effect of lag, and the lags at which relations become maximal. A simulation compares common longitudinal mediation methods with CTMs. Reanalysis of a published covariance matrix demonstrates that CTMs can be fit to data used in longitudinal mediation studies.

Kurtzer et al.: Singularity: Scientific containers for mobility of compute

Kurtzer-Sochat-Bauer-2017

Gregory M. Kurtzer, Vanessa Sochat, and Michael W. Bauer. “Singularity: Scientific containers for mobility of compute”. In: *PLOS ONE* 12.5 (May 2017). Ed. by Attila Gursoy, e0177459. DOI: [10.1371/journal.pone.0177459](https://doi.org/10.1371/journal.pone.0177459).

Merkel: Docker: Lightweight Linux containers for consistent development and deployment

Merkel-2014

Dirk Merkel. “Docker: Lightweight Linux containers for consistent development and deployment”. In: *Linux Journal* 2014.239 (2014), p. 2.

Neale et al.: OpenMx 2.0: Extended Structural Equation and Statistical Modeling

Neale-Hunter-Pritikin-et-al-2015

Michael C. Neale et al. “OpenMx 2.0: Extended Structural Equation and Statistical Modeling”. In: *Psychometrika* 81.2 (Jan. 2015), pp. 535–549. DOI: [10.1007/s11336-014-9435-8](https://doi.org/10.1007/s11336-014-9435-8).

Abstract: The new software package OpenMx 2.0 for structural equation and other statistical modeling is introduced and its features are described. OpenMx is evolving in a modular direction and now allows a mix-and-match computational approach that separates model expectations from fit functions and optimizers. Major backend architectural improvements include a move to swappable open-source optimizers such as the newly written CSOLNP. Entire new methodologies such as item factor analysis and state space modeling have been implemented. New model expectation functions

including support for the expression of models in LISREL syntax and a simplified multigroup expectation function are available. Ease-of-use improvements include helper functions to standardize model parameters and compute their Jacobian-based standard errors, access to model components through standard R \$ mechanisms, and improved tab completion from within the R Graphical User Interface.

Ou et al.: What’s for dynr: A package for linear and nonlinear dynamic modeling in R
Ou-Hunter-Chow-2019

Lu Ou, Michael D. Hunter, and Sy-Miin Chow. “What’s for dynr: A package for linear and nonlinear dynamic modeling in R”. In: *The R Journal* 11.1 (2019), p. 91. DOI: [10.32614/rj-2019-012](https://doi.org/10.32614/rj-2019-012).

Abstract: Intensive longitudinal data in the behavioral sciences are often noisy, multivariate in nature, and may involve multiple units undergoing regime switches by showing discontinuities interspersed with continuous dynamics. Despite increasing interest in using linear and nonlinear differential/difference equation models with regime switches, there has been a scarcity of software packages that are fast and freely accessible. We have created an R package called dynr that can handle a broad class of linear and nonlinear discrete and continuous-time models, with regime-switching properties and linear Gaussian measurement functions, in C, while maintaining simple and easy-to-learn model specification functions in R. We present the mathematical and computational bases used by the dynr R package, and present two illustrative examples to demonstrate the unique features of dynr.

Rosseel: lavaan: An R package for structural equation modeling
Rosseel-2012

Yves Rosseel. “lavaan: An R package for structural equation modeling”. In: *Journal of Statistical Software* 48.2 (2012). DOI: [10.18637/jss.v048.i02](https://doi.org/10.18637/jss.v048.i02).

Abstract: Structural equation modeling (SEM) is a vast field and widely used by many applied researchers in the social and behavioral sciences. Over the years, many software packages for struc-

tural equation modeling have been developed, both free and commercial. However, perhaps the best state-of-the-art software packages in this field are still closed-source and/or commercial. The R package lavaan has been developed to provide applied researchers, teachers, and statisticians, a free, fully open-source, but commercial-quality package for latent variable modeling. This paper explains the aims behind the development of the package, gives an overview of its most important features, and provides some examples to illustrate how lavaan works in practice.