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Manuscript Information Overview

Manuscript ID	**mathematics-2265149**
Status	Rejected
Article type	Article
Title	Check your outliers! An accessible introduction to identifying statistical outliers in R with easystats
Journal	*Mathematics* (https://www.mdpi.com/journal/mathematics)
Section	Probability and Statistics (https://www.mdpi.com/journal/mathematics/sections/probability_and_statistics_theory)
Special Issue	Advances in Statistical Computing (https://www.mdpi.com/journal/mathematics/special_issues/Advances_in_Statistical_Computing)
Abstract	Beyond the challenge of keeping up-to-date with current best practices regarding the diagnosis and treatment of outliers, an additional difficulty arises concerning the mathematical implementation of the recommended methods. In this paper, we provide an overview of current recommandations and best practices and demonstrate how they can easily and conveniently be implemented in the R statistical computing software, using the *{performance}* package of the *easystats* ecosystem. We cover univariate, multivariate, and model-based statistical outlier detection methods, their recommended threshold, standard output, and plotting methods. We conclude with recommendations on the handling of outliers: the different theoretical types of outliers, whether to exclude or winsorize them, and the importance of transparency.
Keywords	univariate outliers; multivariate outliers; robust detection methods; R; easystats
Manuscript File	manuscript.zip (/user/manuscripts/displayFile/33cbf34f213213b17592675ce62aec55)
PDF File	manuscript.pdf (/user/manuscripts/displayFile/33cbf34f213213b17592675ce62aec55/latest_pdf)

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Author Information

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Manuscript Information

Received Date	21 February 2023
Submission to First Decision (Days)	29
Submission to Publication (Days)	
Word Count	2098
Page Count	11

Editor Decision

Decision	Reject and encourage resubmission
Comments	Less convinced as a scientific research is the major concern. I cannot find a solid contribution for the statistical methodologies, new packages, or sound applications in this study. Almost all the obtained conclusions are known. The readers would be happy to see more convincing results from good real examples from the real world if only the well known statistical methods and packages are used in this study. The tutorial-like results using the examples in R are too weak for an academic paper. It is contributive if the authors can include real examples in different areas to show the power of the used package and present the insight findings, not just show how to use the packages. Then, resubmit the revision as a new paper for review.
Decision Date	22 March 2023

Review Report

Reviewer 1	Review Report (Round 1) (/user/manuscripts/review/36643274?report=27508999)
Reviewer 2	Review Report (Round 1) (/user/manuscripts/review/36645867?report=27515065)
Reviewer 3	Review Report (Round 1) (/user/manuscripts/review/36697634?report=27554760)

APC information

Journal APC:	2,100.00 CHF
IOAP Participant:	McGill University
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IOAP Discount:	10%
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Silalahi, D.D.; Midi, H.; Arasan, J.; Mustafa, M.S.; Caliman, J.-P. Kernel Partial Least Square Regression with High Resistance to Multiple Outliers and Bad Leverage Points on Near-Infrared Spectral Data Analysis. *Symmetry* **2021**, *13*, 547. doi: 10.3390/sym13040547 (https://doi.org/10.3390/sym13040547)

If you have any questions or concerns, please do not hesitate to contact mathematics@mdpi.com (mailto: mathematics@mdpi.com).

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Journal: Mathematics (https://www.mdpi.com/journal/mathematics) (ISSN 2227-7390)

Manuscript ID: mathematics-2265149

Type: Article

Title: Check your outliers! An accessible introduction to identifying statistical outliers in R with easystats

Authors: Rémi Thériault * , Mattan S. Ben-Shachar , Indrajeet Patil , Daniel Lüdecke , Brenton M. Wiernik , Dominique Makowski

Section: Probability and Statistics (https://www.mdpi.com/journal/mathematics/sections/probability_and_statistics_theory)

Special Issue: Advances in Statistical Computing (https://www.mdpi.com/journal/mathematics/special_issues/Advances_in_Statistical_Computing)

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Author's Reply to the Review Report (Reviewer 1)

Please provide a point-by-point response to the reviewer's comments and either enter it in the box below or upload it as a Word/PDF file. Please write down "Please see the attachment." in the box if you only upload an attachment. An example can be found here (/bundles/mdpisusy/attachments/Author/Example for author to respond reviewer - MDPI.docx?1e53c61ae425d6e8).

* Author's Notes to Reviewer

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Quality of English Language
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(x) I am not qualified to assess the quality of English in this paper

	Yes	Can be improved	Must be improved	Not applicable
Does the introduction provide sufficient background and include all relevant references?	(x)	( )	( )	( )
Are all the cited references relevant to the research?	(x)	( )	( )	( )
Is the research design appropriate?	(x)	( )	( )	( )
Are the methods adequately described?	(x)	( )	( )	( )
Are the results clearly presented?	( )	(x)	( )	( )
Are the conclusions supported by the results?	(x)	( )	( )	( )

Comments and Suggestions for Authors

In this paper, the authors have shown how to search for outliers using the check_outliers() function of the {performance} package while following current good practices. This contribution will help researchers engage in good search practices while providing an outlier detection experience. They cover univariate, multivariate,

and model-based statistical outlier detection methods, their recommended threshold, standard output, and plotting methods. The present paper represents the subject of check the outliers, An accessible introduction to identifying statistical outliers in R with easystats. The study design and methods appropriate for the research question. The results presented clearly and accurately. The authors logically explain the findings. I highly recommend the publication of this paper in Mathematics Journal.

Submission Date	21 February 2023
Date of this review	03 Mar 2023 23:24:46

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Author's Reply to the Review Report (Reviewer 2)

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	Yes	Can be improved	Must be improved	Not applicable
Does the introduction provide sufficient background and include all relevant references?	(x)	( )	( )	( )
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Is the research design appropriate?	(x)	( )	( )	( )
Are the methods adequately described?	( )	(x)	( )	( )
Are the results clearly presented?	( )	(x)	( )	( )
Are the conclusions supported by the results?	(x)	( )	( )	( )

Comments and Suggestions for Authors

The authors propose the illustration of an R library for detecting outliers. The paper is quite clear, however, the following remarks are provided to improve the article

- The word accessible in the title should be removed.

- The authors should clarify whether the functions implemented in the library were implemented only for continuous variables or other types of variables are also considered.

- The author's reference to the Normal distribution on page 2, line 31 is unclear. They should clarify or delete this sentence.

- The reference to the mathematical score is unclear on page 2, line 36. I think this reference should be removed.

A critical review on the analysis of outliers is proposed in this article which must be cited
Riani, M., & Atkinson, A. C. (2020). Robust regression methods in machine learning. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery, 10(2), e1359.
2

- Page 3, lines 101-102: It is unclear what the authors mean when referring to BCA, a technique used in non-parametric bootstrapping, but the paper does not mention this.

- It is necessary to change the x-axis labels of all the figures as the numbers overlap; they should be written in a smaller font or otherwise eliminate some of them since they are not readable. I am talking about the figures referring to the histogram of the outliers.

- Page seven, line 146, it is better to write association instead of relationship.

- Page 7, line 154, the authors should specify what they mean by compatible regression models.

- Page 7, code of the first chunk, the authors use the iqr method, but this is not discussed above. They must add details of all the methods they show in the output.

- Page 9, line 247, it is difficult to follow the discussion for those unfamiliar with the R datawizard package. What does it do? How does the proposed function tie in with those in the package?

- Page 10, line 272, what does " Registration " mean?

- Check the reference style because it is not uniform

Submission Date 21 February 2023

Date of this review	12 Mar 2023 11:11:56

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Are the methods adequately described?	( )	( )	( )	(x)
Are the results clearly presented?	( )	( )	( )	(x)
Are the conclusions supported by the results?	( )	( )	( )	(x)

Comments and Suggestions for Authors

The paper outlines techniques for processing data with inhomogeneities, such as outliers. However, the style of the article does not correspond to scientific research. The work is educational and auxiliary in nature and is more in line with educational publications, including popular scientific ones.

Submission Date	21 February 2023
Date of this review	24 Feb 2023 08:09:08