# Notes

JOSS welcomes submissions from broadly diverse research areas. For this reason, we require that authors include in the paper some sentences that explain the software functionality and domain of use to a non-specialist reader. We also require that authors explain the research applications of the software. The paper should be between 250-1000 words. Authors submitting papers significantly longer than 1000 words may be asked to reduce the length of their paper.

Your paper should include:

* A list of the authors of the software and their affiliations, using the correct format (see the example below).
* A summary describing the high-level functionality and purpose of the software for a diverse, non-specialist audience.
* A Statement of need section that clearly illustrates the research purpose of the software and places it in the context of related work.
* A list of key references, including to other software addressing related needs. Note that the references should include full names of venues, e.g., journals and conferences, not abbreviations only understood in the context of a specific discipline.
* Mention (if applicable) a representative set of past or ongoing research projects using the software and recent scholarly publications enabled by it.
* Acknowledgement of any financial support.

# Checking that your paper compiles

JOSS uses Pandoc to compile papers from their Markdown form into a PDF. There are a few different ways you can test that your paper is going to compile properly for JOSS:

GitHub Action

If you’re using GitHub for your repository, you can use the Open Journals GitHub Action to automatically compile your paper each time you update your repository.

The PDF is available via the Actions tab in your project and click on the latest workflow run. The zip archive file (including the paper.pdf) is listed in the run’s Artifacts section.

# Checklist

~~General checks~~

* ~~Repository: Is the source code for this software available at the repository url?~~
* ~~License: Does the repository contain a plain-text LICENSE file with the contents of an OSI approved software license?~~
* ~~Contribution and authorship: Has the submitting author made major contributions to the software? Does the full list of paper authors seem appropriate and complete?~~

Functionality

* ~~Installation: Does installation proceed as outlined in the documentation?~~
* Functionality: Have the functional claims of the software been confirmed?
* ~~Performance: If there are any performance claims of the software, have they been confirmed? (If there are no claims, please check off this item.)~~

Documentation

* ~~A statement of need: Do the authors clearly state what problems the software is designed to solve and who the target audience is?~~
* ~~Installation instructions: Is there a clearly-stated list of dependencies? Ideally these should be handled with an automated package management solution.~~
* Example usage: Do the authors include examples of how to use the software (ideally to solve real-world analysis problems).
* ~~Functionality documentation: Is the core functionality of the software documented to a satisfactory level (e.g., API method documentation)?~~
* Automated tests: Are there automated tests or manual steps described so that the functionality of the software can be verified?
* ~~Community guidelines: Are there clear guidelines for third parties wishing to 1) Contribute to the software 2) Report issues or problems with the software 3) Seek support~~

Software paper

* Summary: Has a clear description of the high-level functionality and purpose of the software for a diverse, non-specialist audience been provided?
* ~~A statement of need: Does the paper have a section titled ‘Statement of need’ that clearly states what problems the software is designed to solve, who the target audience is, and its relation to other work?~~
* ~~State of the field: Do the authors describe how this software compares to other commonly-used packages?~~
* ~~Quality of writing: Is the paper well written (i.e., it does not require editing for structure, language, or writing quality)?~~
* ~~References: Is the list of references complete, and is everything cited appropriately that should be cited (e.g., papers, datasets, software)? Do references in the text use the proper citation syntax?~~

# paper.md

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title: 'Biomechanics Analysis and Reporting Application: A MATLAB package for lab managers and scientists'

tags:

- MATLAB

- biomechanics

- processing

- treatment

- human movement

- dynamical systems

- nonlinear analysis

authors:

- name: Benjamin Senderling

orcid: 0000-0003-2502-0553

equal-contrib: true

affiliation: 1

- name: Deepak Kumar

equal-contrib: true # (This is how you can denote equal contributions between multiple authors)

affiliation: "1, 2" # (Multiple affiliations must be quoted)

affiliations:

- name: Department of Physical Therapy and Athletic Training, Sargent College, Boston University, USA

index: 1

- name: Boston University School of Medicine, USA

date: 5 January 2023

bibliography: paper.bib

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# Summary

Biomechanics is a field with scientists of diverse backgrounds. Students, faculty and staff may have backgrounds in the sciences, engineering, healthcare or education. It is important for them to produce new and meaningful insights, to reproduce prior works and build an understanding of their own. Biomechanics is the application of math and physics to understand biological motion. Experiments involve differs equipment to measure motion, acceleration, force, oxygen consumption and others. Learning to use this equipment and analyze their data can be an arduous and time consuming task for new students. Teaching their use can be time consuming for faculty and staff. The Biomechanics Analysis and Reporting Application (BAR App) is a package aims to facilitate these efforts by offering a dynamic framework to extract data, perform data processing and analysis, produce figures, and format the results for additional statistical analysis. The package allows new users to develop their own code within a framework that promotes their own learning but handles more nuanced, but time-consuming aspects of data processing. Furthermore, it allows experienced users to develop less code for repeated complex analysis methods, which new users can also run while developing their understanding of the methods.

# Statement of need

BAR App is a MATLAB package intended for use in the field of biomechanics. MATLAB is commonly used in this field but code is often specific to individual groups or experiments with little cross-compatibility. These scientists may be students with little programming experience, experienced research staff or faculty. The package provides a high-level user interface with a dynamic environment. This allows users to develop their code and make use of more complex contributions. It interfaces well with existing packages [@NONAN:2021] and can make use of others [@MOVAN:2021] with modifications. Biomechanics research makes use of varied equipment, raw data formats and analysis methods. As an open-source contribution, the BAR App provides a structured framework for this research to consolidate efforts and increase reproducibility in data analysis.

This package was designed within a biomechanics laboratory with a focus on reusing existing code and providing a tool for medical and physical therapy graduate students, and undergraduate students, to use on their own. Within its framework, complex analysis code could be developed for a particular project. The same code could then be reused for another project while only writing new code to extract unprocessed information from new data files. The high-level interface allows students to use this same code. Or a student may use it to compile existing data of their own, promoting independence from research staff in their work. In these ways it would increase the productivity of a lab and the quality of their contributions.

# paper.bib

@misc{NONAN:2021,

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publisher = {GitHub},

journal = {GitHub repository},

url = {https://github.com/Nonlinear-Analysis-Core/NONANLibrary}

}

@misc{MOVAN:2021,

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year = {2021},

publisher = {GitHub},

journal = {GitHub repository},

url = {https://github.com/Movement-Analysis-Core/MOVAN-Library}

}