

CinC Proceedings Paper Checklist for the PhysioNet Challenge 2024

Overall

- The paper uses a CinC proceedings paper template (LaTeX or Word). CinC provides general templates, and we provide templates with instructions for the Challenge on <https://physionetchallenges.org/2024/papers/>.
- The font size, spacing, and margins are unchanged from the template.
- The paper is not more than 4 pages long in total, including the title, author list and affiliations, figures, tables, acknowledgments, references, and any appendices.
- The paper is not much less than 4 pages long, e.g., it is not shorter than 3.5 pages long. We usually recommend that the authors write more in their methods section if the paper is too short. We do not recommend that authors include figures and tables that do not add to their paper to increase the length of their paper.

Title and Authors

- The title is the same as the abstract title. If the authors were unable to update their abstract title, then they can update their paper title and let the production staff sort it out.
- The title does not contain the words 'PhysioNet', 'Challenge', 'Computing in Cardiology', or the like.
- The title is not generic - e.g.: 'Digitization and Classification of ECG Images using Deep Learning'. It should specify what was novel about this approach to differentiate it from the others.
- The authors provide their names and affiliations, and these must include all authors of the code submitted.

Abstract

- The abstract is no more than 25 lines long (in the 2-column formatted article).
- The abstract does not contain footnotes or references.
- The abstract defines all abbreviations (except for extremely common abbreviations (such as ECG, AUC), and even then, it's harmless enough to add the words in the abbreviation).
- The abstract includes the team name used in the challenge.
- If a team is ranked, then the abstract includes the official scores and ranks on the hidden data, specifically the scores that we used to rank the teams for each task.
- If a team is not ranked, but we were able to score the team on the hidden data, then the abstract includes the official scores on the hidden data, specifically the scores that we used to rank the teams for each task.
- If we were not able to score a team on the hidden data, then the abstract says that the team was unable to be scored on the hidden data, and the abstract does not include scores or rankings that could confuse readers about the performance of the team.

- The authors do not refer to 'local' test sets, which are subsets of the training set. They can refer to a 'held-out subset of the training set'. Better yet, they can report cross-validation results on the training set. ... As long as they note that these aren't comparable to the official challenge scores. They should not quote scores from earlier in the challenge (on the validation set) or claim any ranking other than the official ranking. (E.g. 'we were the top scoring team for the validation data' is not acceptable.)
- The scores and rankings match the records on the Challenge website, which will be updated after CinC 2024: <https://physionetchallenges.org/2024/results/>.
- The abstract does not describe the data, objective, scoring, organization and structure, or other details of the Challenge.
- The abstract indicates that the article is part of the 'Digitization and Classification of ECG Images: The George B. Moody PhysioNet Challenge 2024'.

Introduction

- The introduction is brief.
- The introduction does not describe the Challenge beyond 1-3 short sentences; the authors should cite the Challenge description paper (see below) to describe the Challenge in general. They should focus most of their space in the paper on describing their contributions to the Challenge.
- The introduction does not include methods or results.

Methods

- The methods section is the largest section in the paper – ideally at least 3 pages.
- The methods section is detailed.
- The methods section includes a description of any data processing steps, including any exclusion criteria or relabeling of the training data, and external data used, etc.
- The methods section includes a description of all the parameters that were optimized and how they were optimized, including any data and methods that were used for optimization. If the authors picked a parameter without optimizing, then that choice is clearly described. A table of parameters and their optimized or chosen values is allowed and encouraged.
- The methods section cites relevant sources for existing techniques or tools. Ideally, it does not cite generic references such as textbooks. If it does cite textbooks and similar resources, the correct pages must be identified.

Results

- The results section reports the Challenge score (SNR for digitization, macro F -measure for classification) on the Challenge data.
- The scores are consistent with the published scores on the Challenge website.
- The results section can include other metrics to provide insight into the method, but the Challenge scores are clearly reported.

- The results section includes the mandatory tables to summarize the teams results. The tables are not formatted differently to allow the readers to easily compare results between different Challenge papers. Please see the below example.

Task	Score	Rank
Digitization	SNR: 1.234	5/12
Classification	F-measure: 0.567	4/12

Table X: Signal-to-noise (SNR) ratio and F-measure of our team’s model on the hidden data for the digitization and classification tasks, respectively.

- The authors do not refer to 'local' test sets, which are subsets of the training set. They can refer to a 'held-out subset of the training set'. Better yet, they can report cross-validation results on the training set. ... As long as they note that these aren't comparable to the official challenge scores. They should not quote scores from earlier in the challenge (on the validation set) or claim any ranking other than the official ranking. (E.g. 'we were the top scoring team for the validation data' is not acceptable.)
- The results section does not interpret the results.

Discussion and Conclusions

- The discussion and conclusions sections can be separate or combined.
- The discussion section interprets the results. The conclusions section summarizes the discussion and work.
- The discussion section supports any conclusions empirically, logically, or by reference. In other words, any statements are justifiable and justified.
- The discussion section points out weaknesses and potential improvements but overall provides an honest reflection and the work.
- Any comparisons made with other papers are fair.

Variables, Equations, Figures, and Tables

- The paper defines, describes, and refers to all variables immediately before or after using them.
- The paper uses appropriate significant figures, i.e., number of decimal places.
- The paper uses equations when appropriate.
- All equations use appropriate notation and formatting.
- The paper uses tables when appropriate.
- The paper uses figures when appropriate.
- All figures and tables
 - are informative, e.g., not generic or low-information content,
 - are relevant, e.g., not generic or low-information content,

- include variables and units in the column headers and figures axes, e.g., 'Frequency (Hz)' or 'Time (s)',
- have large enough and legible text,
- are properly sized,
- have high-resolution, and ideally vector graphics,
- are referenced from the main text,
- are sequentially numbered,
- appear close enough to where they are referenced in the text,
- have appropriately chosen colors, e.g., not illegible in black and white or inaccessible for those who have color perception issues.
- All table and figure captions are self-contained. They include details to help readers interpret the tables and figures but do not provide interpretation, which is better done in the main text. They define abbreviations, even when defined in the main text. If there are no units or the units are normalized, then write '(n.u.)'. If the units are arbitrary, then write '(a.u.)'.

Acknowledgements

- The acknowledgements provide any acknowledgments and conflicts of interest.
- The acknowledgements include the official organization that funded the authors, if relevant, and anyone who contributed but not enough to gain authorship (e.g., those that provided advice, code, and non-Challenge data).
- The acknowledgements section does not thank the organizers of the Challenge or the providers of the Challenge data. While appreciated, the space is better used elsewhere.

Citations, References, and Contact

- The paper properly cites the Challenge description paper:

Reyna MA, Deepanshi, Weigle J, Koscova Z, Elola A, Seyedi S, Campbell K, Clifford GD, Sameni R. Digitization and Classification of ECG Images: The George B. Moody PhysioNet Challenge 2024; 51: 1-4.

```
@article{2024Challenge,
  author = {Reyna, Matthew A. and Deepanshi and Weigle, James and Koscova, Zuzana and Elola, Andoni and Seyedi, Salman and Campbell, Kiersten and Clifford, Gari D. and Sameni, Reza},
  title = {{D}igitization and {C}lassification of {ECG} {I}mages: {T}he {G}eorge {B}.\{M}oody {P}hysio{N}et {C}hallenge 2024},
  journal={Computing in Cardiology},
  volume={51},
  pages={1--4},
  year={2024},
  publisher={IEEE}
}
```

- The paper properly cites the Challenge data paper:

Reyna MA, Deepanshi, Weigle J, Koscova Z, Campbell K, Shivashankara KK, et al. ECG-Image-Database: A dataset of ECG images with real-world imaging and scanning artifacts; a foundation for computerized ECG image digitization and analysis, 2024. URL <https://arxiv.org/abs/2409.16612>.

```
@misc{ECG-Image-Database,  
  title={{ECG}-{}image-{}Database: A Dataset of {}ECG{} Images with Real-World  
  Imaging and Scanning Artifacts; A Foundation for Computerized {}ECG{} Image  
  Digitization and Analysis},  
  author={Matthew A. Reyna and Deepanshi and James Weigle and Zuzana Koscova  
  and Kiersten Campbell and Kshama Kodthalu Shivashankara and Soheil Saghafi  
  and Sepideh Nikookar and Mohsen Motie-Shirazi and Yashar Kiarashi and Salman  
  Seyedi and Gari D. Clifford and Reza Sameni},  
  year={2024},  
  eprint={2409.16612},  
  archivePrefix={arXiv},  
  primaryClass={q-bio.QM},  
  url={https://arxiv.org/abs/2409.16612},  
}
```

- The paper properly cites the other papers as appropriate:

<https://physionetchallenges.org/2024/papers/>

- The paper properly cites the other Challenge papers when referenced. This is the format for this year's CinC proceedings paper publications:

Authors et al. Title. In 2024 Computing in Cardiology (CinC), volume 51. 2024; 1–4.

- The paper does not cite a URL, a website, or any other reference to describe the Challenge.
- The paper does not cite irrelevant publications.
- The references are properly formatted, including proper capitalization and details.
 - Citation information from Google Scholar and other resources may have incorrect or improperly formatted information. Please review the citation information before using it.
 - Examples of incorrect capitalization include 'physionet', 'cinc', 'ecg', 'pcg', 'qrs', 'physiological measurement', and 'neurips'.
 - Your BibTeX file may have the correct capitalization, but your PDF file may not. You can force BibTeX to preserve capitalization in your BibTeX file by enclosing letters in braces, e.g., '{P}hysio{N}et' and '{ECG}'.

- The contact information includes the name, address, and email address of one or more authors. One contact is usual, but multiple contacts are fine.