

CSC 450, Senior Research Research Article Rubric

Your *research* article must describe an investigation in the area of computer science that is centered around a specific hypothesis that you will test or an objective you will meet by designing a method or model, collecting and analyzing data, and drawing conclusions using an appropriate and reproducible methodology. Your investigation and article must meet the standards of a computer science or scientific journal.

You must submit this assignment through Blackboard by the deadline on the due date to receive credit.

Note about grading: Your overall grade will generally be determined using the point system, with the following exceptions:

- If one or more components earn a D-F grade then your article is "unacceptable", and you will receive a D-F grade overall.
- Your grade will be reduced if the final five categories (Grammar and Style, Reproducible Research, Author Contributions, and Revisions) are not *Excellent*.
- For the *rough draft*, you will SKIP the abstract and proceed as follows (select one):
 - You may skip the discussion, but complete the results section
 - You may partially complete the Results and Discussion sections, and use yellow highlighting to indicate what will be filled in later. In this case, your Results section **must** include 1-2 figures and/or tables, the discussion should be complete with the exception of discussing *specific* results. The methods section must also be complete.
- If your project involves Human Subjects Research, the online certification (<https://phrp.nihtraining.com/users/login.php>) must be completed and turned in prior to or with the rough draft. An appropriate consent form must also be turned in at this time.

Simplified example of incomplete results section:

We analyzed 1,553,281 tweets from the weekend of October 24-25, of which 3.4% of tweets had keywords relevant to our study. We found that 55% of tweets included keywords related to *cats* (e.g., cat, kitten, kitty) compared to 45% of tweets with keywords related to *dogs* (e.g., dog, puppy) (**Fig 1**). We then analyzed whether preference for cat or dog varied across geographical regions in the United States. When we looked separately at tweets from the west, midwest, south, and northeast, we found that [results coming].

Note about Figure and Table captions

Figure captions appear *below* the figure while table captions appear *above* the table. All figures and tables are independently numbered starting with 1 (e.g. a paper can include Figure 1, Figure 2, Table 1, Table 2, etc). Table and figure captions *clearly* describe the information in the table or figure, and the reader should not have to refer to the main text to understand the table or figure. Tables and figures should always be centered and cited in the text (e.g., According to **Fig. 1**, ...).

Tables and figures must reflect your own work and own data (for pointers, see: https://www.e-education.psu.edu/styleforstudents/c4_p12.html)

Project Rubric

| Component | Points | Poor (D-F range) | Average (C range) | Excellent (A range) |
|----------------------------------|--------|---|---|---|
| Abstract | 15 | There is no abstract or the abstract exceeds the word limit, or more than two components are missing. | The description is not clear or two of the components (background, significance, objective, methodology, results, conclusions) are missing. | A clear and concise description of the proposal in no more than 200 words that briefly mentions/summarizes the background and significance of the work, the objective, the methodology, the results, and conclusions. |
| Introduction | 15 | There is no introduction or more than two components are missing. | The description is not clear or two of the components (background, significance, objective/hypothesis, last paragraph) is missing. | A clear and concise description of the significance and background relevant to the investigation. The objective or hypothesis is clearly stated. The last paragraph of the introduction briefly summarizes the study and describes the results that will be presented ("In this paper, ..."). |
| Materials and Methods | 15 | Section is missing or extremely inadequate. | The methodology is not clear or does not provide enough information to reproduce the study. | The methodology used to carry out the project is described in sufficient detail so that the investigation can be repeated by others. Appropriate statistical tests are used, if applicable. If the paper includes developing a model or program, only the technical aspects (programming language, computational resources) are included here; the model or program is described in the Results section. References to previously used methods are included, if applicable. |
| Results | 15 | Section is missing, or incomplete. | Graphs and/or tables are provided but are not referenced in the text or adequately captioned. The description of how the results are generated is not clear, or the results are presented in a biased manner and/or in a context that should be saved for the Discussion. | An unbiased presentation of the results. A total of at least three graphs or tables are included, properly captioned, and referenced in the paper. The text of this section points out the most important results, or trends, but does not unnecessarily repeat information in the tables or graphs. Enough methodological details are provided so that the reader knows how the results were generated, so this section can stand on its own. Details of the methodology that are not necessary for understanding the results are left to the Methods section, which is referenced, if applicable. |
| Discussion | 15 | More than two components are missing | One of the components (related work, significance, limitations, and future work) is missing or is not adequate. | The results are put into the context of the discipline and discussed in the context of related work. The significance of and limitations of the results are discussed. Possible extensions and future work are also discussed. The last paragraph summarizes the results from the paper |
| Bibliography (and references) | 15 | Section is missing and/or references are not cited in the text | The article does not include the correct number of references or research articles; or the | Relevant references are appropriately cited in the manuscript. At least 5 references must be cited in the Introduction and at least 3 in the Discussion. At least 6 references must be <i>research</i> |

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| | | | appropriate number of citations are included but do not follow the correct format. | articles. References are cited inline using the appropriate parenthetical citation, e.g., (Smith 2013) and are listed alphabetically by last name. |
| Format and Organization | 10 | There are no section headings or the margin or font size is not appropriate | The paper follows the correct format, but a section heading is missing, or section headings are not bolded. | A bold, centered title is provided in a slightly larger font with the author names underneath. This is followed by the Abstract, then beginning on the next page, the Introduction, Materials & Methods, Discussion, Author Contributions (if applicable), and References. All section headings are in bold and are preceded and followed by a blank line. Figure and Table numbers are bold. The paper is approximately 6 pages, with 1" margins on all sides, font size 11 or 12, Times New Roman or Arial font, and single-spaced. |
| Grammar and Style | - | Many spelling and grammatical mistakes seriously detracts from the ability to understand the article. (-20) | The paper contains a fair number of spelling or grammatical mistakes that detracts from the ability to understand the article. (-10) | The paper is well-written and contains very few, if any, spelling or grammatical mistakes. (-0) |
| Reproducible Research | - | Software or data are not available (-15) | | Relevant software and data are made available on Github or a similar public repository so that the analysis can be replicated. A link to the repository and appropriate description is included in the Methods section. (-0) |
| Human Subjects Research (if applicable) | - | Online tutorial and/or consent form is not complete or not sufficient (-30) | | Online tutorial and consent form has been completed (-0) |
| Author contributions (group projects only) | - | Section is missing (-10) | One component (e.g., who developed a method) is missing (-5) | For group projects only: An author contributions section is provided after the Discussion, that includes who developed the methods, who analyzed data, who wrote the paper (both must be involved in the latter), and additional contributions as appropriate. See below for an example. (-0) |
| Revisions (Final Paper Only) | - | No revisions to the original article are made. (-25) | Track changes are not used or changes are not highlighted (-12) | The majority of my concerns are addressed and the majority of my suggested revisions are taken into account. Track changes is used or changes are highlighted in a different color (-0) |

Author contributions

GMD designed the study. AFP developed the model and performed the experiment. GMD analyzed the data. GMD and AFP wrote the paper.