Put Title Here for BIO/CS 423 Project

Put Author Names Here

**ABSTRACT**

In this paper, we describe … <Put executive summary of your work and results here>

**Categories and Subject Descriptors**

J.J.3 [**Computer Applications**]: Biology and genetics

**General Terms**

Algorithms, Experimentation.

**Keywords**

< put keywords here, such as “microarray”, “phylogenetic tree”, “clustering”>

# INTRODUCTION

Introduce your problem (project), including motivation for why your problem is interesting (convince the reader to keep reading). At the end of the introduction section, include the organizational structure of the paper such as “Following the introduction, we provide more background for this problem, etc.”

# BACKGROUND

Describe the background information for your project. Include in this section biological background, and background on the computational techniques related to or used in your project. Assume the reader is someone who has a basic understanding of biology and CS, but knows nothing about your specific project or proposal (i.e. the reader has taken BIO207 and CS203). You may wish to split this into subsections (one on biology and one on computational techniques).

# METHODS

## Data

Describe the data you used for the project. You do not need to include the actual sequence info here (unless it is short), since you can put the complete data in an appendix. If you created your own data, describe how you created it. If the data is publicly available, cite the location (by URL) and note the data warehouse (such as Genbank or yeastgenome.org). Include the gene names (if applicable) of the sequences and define which sequence data you used (protein, DNA, RNA, etc.)

You may wish to include tables in your report. If so, the format of tables should be as shown in Table 1.

Table . Table captions should be placed above the table

|  |  |  |  |
| --- | --- | --- | --- |
| **Graphics** | **Top** | **In-between** | **Bottom** |
| Tables | End | Last | First |
| Figures | Good | Similar | Very well |

## Methods

Describe the methods you used to complete your project. Describe the algorithms you implemented (you may want to include pseudocode) and describe any tools you used (such as BLAST, Clustalw, Cluster 3.0, Java TreeView). For tools you used, be sure to include the parameter settings used for each.

# RESULTS

Include here the results of your methods on the dataset(s). You may wish to include results in the form of tables and/or figures. Figures should have captions at the bottom of the figure and be labeled Figure 1: xxxx. If you have multiple types of results, you may want to put these into subsections.

# DISCUSSION

Evaluate your results in the Discussion section. This is the “meat” of any research paper. Evaluation should include any of the following that relate to your project:

Running time of algorithm(s)

How would you interpret the results? (For example, if you created a tree or several trees, explain to the reader how to read the tree. If you created graphs/charts, explain to the reader how to read the charts and interpret the results.)

Do the results make biological sense? (For example, if you are clustering or creating trees, do they make sense?)

How do your results compare to other similar methods or tools?

If your project involves multiple methods/algorithms, how do they compare to one another?

How confident are you in the results? Would you caution the reader in making conclusions given your results?

What are the next steps to explore with this project (also called Future Work in papers)

# RELATED WORK

Describe other research and references that relate to your project. How do your results and/or methods and/or data compare to existing projects? What prior research and information does your project leverage?

If you used classic algorithms, cite who created them and explain differences (if any) your implementation uses.

# CONCLUSIONS

Describe the conclusions you draw from your project. Make sure all points you want the reader to remember are included in this section. (In fact, the abstract and conclusions are probably the most important sections in research papers for readers who are scanning for related work.)

The full paper (including references but NOT including appendices should be at least 4 pages in length and no more than 6 pages in length).

# ACKNOWLEDGMENTS

Thank any people who helped you with the project. Thank the researchers/websites/data sources/tools who provided any data or tools you used.

# REFERENCES

1. Below are example references and the style you should use. Include any books, journals, websites, tools, etc that you used for the project.
2. Bowman, M., Debray, S. K., and Peterson, L. L. 1993. Reasoning about naming systems. ACM Trans. Program. Lang. Syst. 15, 5 (Nov. 1993), 795-825. DOI= <http://doi.acm.org/10.1145/161468.161471>.
3. Ding, W. and Marchionini, G. 1997 A Study on Video Browsing Strategies. Technical Report. University of Maryland at College Park.
4. Fröhlich, B. and Plate, J. 2000. The cubic mouse: a new device for three-dimensional input. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (The Hague, The Netherlands, April 01 - 06, 2000). CHI '00. ACM Press, New York, NY, 526-531. DOI= <http://doi.acm.org/10.1145/332040.332491>
5. Tavel, P. 2007 Modeling and Simulation Design. AK Peters Ltd.
6. Sannella, M. J. 1994 Constraint Satisfaction and Debugging for Interactive User Interfaces. Doctoral Thesis. UMI Order Number: UMI Order No. GAX95-09398., University of Washington.
7. Forman, G. 2003. An extensive empirical study of feature selection metrics for text classification. J. Mach. Learn. Res. 3 (Mar. 2003), 1289-1305.
8. Brown, L. D., Hua, H., and Gao, C. 2003. A widget framework for augmented interaction in SCAPE. In Proceedings of the 16th Annual ACM Symposium on User interface Software and Technology (Vancouver, Canada, November 02 - 05, 2003). UIST '03. ACM Press, New York, NY, 1-10. DOI= <http://doi.acm.org/10.1145/964696.964697>
9. Y.T. Yu, M.F. Lau, "A comparison of MC/DC, MUMCUT and several other coverage criteria for logical decisions", Journal of Systems and Software, 2005, in press.
10. Spector, A. Z. 1989. Achieving application requirements. In Distributed Systems, S. Mullender, Ed. Acm Press Frontier Series. ACM Press, New York, NY, 19-33. DOI= <http://doi.acm.org/10.1145/90417.90738>

Columns on Last Page Should Be Made As Close As Possible to Equal Length (Delete this when you are finished with the paper.)

# APPENDICES

## User Manual: Readme

Describe how a user uses the code/program(s) you wrote. Describe the format of the input to functions (especially input that is in the form of a file) and the format of the output (especially if output is in the form of a file). If you did not write code, describe how to use the software that your team used for this project.

## Source Code

Include the code you wrote/modified (paste it here as an appendix to your paper in 8-pt Courier font). Your code should be formatted cleanly and appropriately commented. If the code is really long, put sample code in the Appendix and refer to the name of the zip file containing your code here.

## Anything Else

Put any other information that is related to your project here. This might include protein sequences, DNA sequences, etc that you used as data for your project. You may include results/figures/tables that did not fit into your paper.