

**CMPSC 580**  
**Junior Seminar**  
**Spring 2021**

Assignment 10:

# Writing the Method of Approach and Evaluation Strategy Sections, Abstract and Conclusion



Figure 1: The Methods of Approach Section enables the reader to understand and follow how the project is set-up. This means that all the ingredients of the project (i.e., libraries, software, data, cited techniques from other works, forms of analysis, models, algorithms and other project building blocks) are clearly introduced in the order of their use. In addition to defining each of these parts, they must also be discussed in terms of how they are used together in the project (i.e., comprising the project's *Method*) to reach the project's goals. The Methods of Approach Section also provides information about how to reproduce the project so that the experiments and results may be recreated in subsequent projects.

## Clone Your Assignment Repository

Today's assignment repository can be found at the below link to a GitHub Classroom repository. Here you will work on your assignment and then push your work to the cloud where the instructor will be able to view your work for grading. Often, there will be files in your assignment repositories which you are to edit before you submit them by using the below commands for `git`. Note, you will be using this same repository to complete your proposal section by section. You will be adding your sections to the `SeniorThesisProposal.tex` document.

<https://classroom.github.com/a/1P9rBMmB>

To use this link, please follow the steps below.

- Click on the link and accept the assignment
- Once the importing task has completed, click on the created assignment link which will take you to your newly created GitHub repository for this lab,

- Clone this repository (bearing your name) and work locally
- As you are working on your lab, you are to commit and push regularly. The commands are the following. GitHub Actions CI will automatically check that your L<sup>A</sup>T<sub>E</sub>Xfile builds correctly.
  - `git add -A`
  - `git commit -m "Your notes about commit here"`
  - `git push`

- When you are ready to create a release and submit a PDF of a section, you must tag your release using the following commands, replacing my name with your own and changing the version number appropriately.

Note: minor changes to your document would be reflected by incrementing the right-most number in the version by one. Larger changes will alter the middle number and left-most numbers.

```
– git add -A  
– git commit -m "Your notes about commit here"  
– git tag senior_thesis_proposal-obonhamcarter-1.0.0  
– git push -u origin main --tags
```

Please be sure to read the `README.md` file to help with your push tasks. After you have pushed your work to your repository, please visit the repository's GitHub website (you may have to log-in) to verify that your files were correctly sent.

## Method of Approach Section

Whenever you are writing about how to complete a technical task, the steps must be clearly written-out, so that the task may be *reproduced* by other researchers. Noted in Figure 1. the reproducibility of the research's results may determine whether your readers accept your methodology and your project's outcomes. In other words, if the methods and experiments in your work cannot be redone by others, exactly as you have done, and with the same results, then the conclusions of the work may appear untrustworthy. It is therefore essential that each step of your method be detailed and justified so that your work may be reproduced and confirmed by others.

The Method of Approach section in your proposal is also the section where you will inform the reader about what steps are involved to complete your project. The discussion of the steps may include description of algorithms, technologies (software tools, programming languages, etc.), data sets, analyses and similar elements of research that are involved in your work. This section tends to attract the most criticism if the writing contains flaws. The readers will discredit the whole work if the Methods section appears to be inappropriate or misinformed for the project. It is therefore necessary to write your Method of Approach section clearly where each of your steps is clearly discussed to support the project.

In this assignment, you will locate and study the accessories to the method which are relevant to your own project, which may include theories, algorithms, hardware and software tools, etc. that

you can use to conduct the work you are proposing. Once you have found an accessory to your method that you believe will benefit your work, be sure to make a note of the technology and then describe how this accessory will be used in your own project.

### **Part 1: An Extended Outline of the Method of Approach Section**

We have spent some time learning how to create simple outlines. In this part, you will proceed directly to the extended outline as a deliverable. To help you write this outline, you are encouraged to invest some time in the simple outline to determine the flow before continuing to the extended outline process.

First, spend time to determine which accessories will be relevant to your project. Be sure to ask questions about the technology's significance to your own academic pursuit. Does some new technology make sense to use in your project? Will this tool or software be necessary for the completion of your work? Will a theoretical framing, an algorithm or a tool that you found online help you to reach your research goals? If you are using any data, how will data be collected and analyzed? Make sure you cite any data, software tools and other sources you describe in this section.

Once you have found the accessories that you feel will be helpful to your work, incorporate these foundational pillars, along with the notes of their usage, into a discussion to describe how they play roles in achieving the goals of your work. For each accessory, please be sure to add a justification about how it will benefit your project in some way.

### **Part 2: Writing the Method of Approach Section**

Once you have a working outline for the Method of Approach section, you can follow it to fill in the text for this section. In addition to an overall description of your approach, materials, and procedures, your Method of Approach section should also describe limitations of your approach, assumptions you are making, and any possible threats to validity in your method.

You can use the assessment points below to evaluate the completeness of your Method of Approach section.

1. The Method of Approach section explains the process to be utilized in the proposed study (**how** the proposed work will be completed).
2. The Method of Approach section includes the description of algorithms, programming languages, platforms and software (as relevant) that will be used in the proposed project.
3. The Method of Approach section includes a discussion of limitations, assumptions and threats to validity.
4. At least one of the following is used in the Method of Approach section: technical diagram, equation, algorithm, graph.
5. The section includes introductory and concluding remarks concerning the use of each accessory that serves your project in some way. For example, the conclusion could include a justification for the inclusion of the accessory.

6. The section follows a logical flow.
7. There are no typographical or grammatical errors in the proposal draft.
8. There is no extraneous text.

### Including a Flowchart and Table

Please add a figure and a table to your Method of Approach Section to facilitate in reading comprehension.

**Figures:** When writing a Method of Approach Section, it is strongly advised to include a flowchart to show how the described pieces of the project come together. For example, in Figure 2, an example of a text mining algorithm is shown. In this illustration, the reader can conveniently understand how the articles are collected and mined for their content. In addition, the reader is able to see how the information flows in this part of the method. *Please note that the caption goes below the figure.*

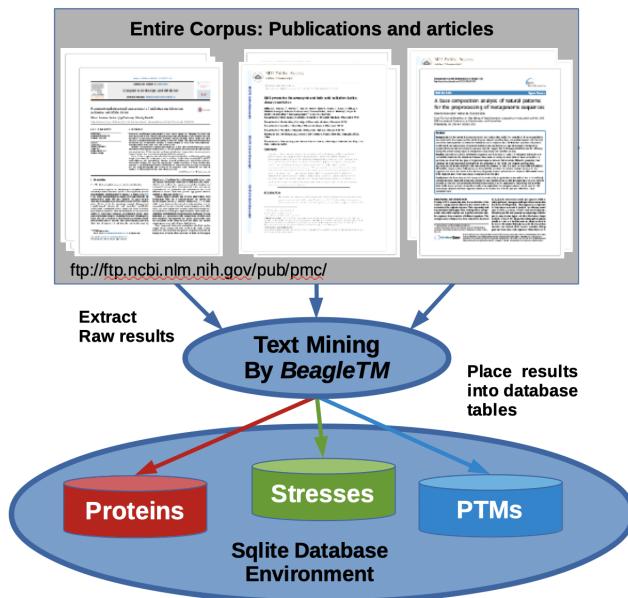


Figure 2: **A graphic is worth a thousands words!** The flowchart describes the actors and their roles that they play in the project. A flowchart in a Method of Approach Section also helps the reader to gain a visual understanding of the described method. This flowchart has been taken from the Method of Approach Section of a recent article [1]. *Please note that the caption goes below the figure.*

**Tables:** Simple tables can be used to help organize information for the reader from the methods section. In Table 1, shown below, the results are designed from the website <https://www.tablesgenerator.com/>. *Please note that the caption goes above the table.*

\begin{table}[h!]

Table 1: This is a sample table and the code is given below. Please note that the caption goes above the table.

Number	Gene Variable	Alpha Test Value	p-Value	Reference
1	gene1	0.05	0.05436	Anderson <i>et al.</i>
2	gene2	0.01	0.02718	Miller <i>et al.</i>
3	gene3	0.05	3.14	Shannon <i>et al.</i>

```

\caption{This is a sample table and the code is given below.  

Please note that the caption goes above the table.}
\label{tab:simpleTable}
\begin{center}
\begin{tabular}{l|lcll}
\hline & Gene Variable & Alpha Test Value & p-Value & Reference \\
\hline\hline
1 & gene1 & 0.05 & 0.05436 & Anderson \emph{et al.} \\
2 & gene2 & 0.01 & 0.02718 & Miller \emph{et al.} \\
3 & gene3 & 0.05 & 3.14 & Shannon \emph{et al.} \\
\hline
\end{tabular}
\end{center}
\end{pre>

```

## The Evaluation Strategy Section

The Evaluation Strategy section should explain what steps you will take to evaluate your proposed method. Here you should describe what testing you will conduct to ensure your software or hardware product is correct. Also, if you intend to conduct experiments, then you must clearly define your evaluation metrics. Note, if you plan to conduct user studies to evaluate your method, then you must describe the user study in detail. Overall, the evaluation takes place after the completion of the project, and assesses the quality and success of a project in reaching its objectives and presents the information collected for project outcomes. In other words, this section is to describe how your project will be successful in reaching its goals.

### Part 3: An Extended Outline of the Evaluation Strategy Section

As before, it might be helpful for you to create an outline for your evaluation before you start writing this section. You should choose criteria by which to evaluate your results when your work will be completed, for example, coverage, efficiency, accuracy, effectiveness, elegance, user friendliness, etc. To get ideas for appropriate evaluation metrics for your project, you can see what others in the related literature have used to assess their work. You should plan to repeat, whenever possible, these tests against competing or previous approaches.

Following our previous outline templates, in your outline for this section, each topic can be the type of evaluation, for example, automated testing, comparison study, user study, etc. Then, for each of these topics you can describe criteria as your points and provide justification for using them as your supporting evidence.

### Part 4: Writing the Evaluation Strategy Section

Once you have a working outline for the Evaluation Strategy section, you can follow it to fill in the text for this section. You can use the assessment points below to evaluate the completeness of your Evaluation Strategy section.

1. The Evaluation Strategy section describes the process to be undertaken to validate the proposed work using applicable evaluation metrics.
2. The section includes introductory and concluding remarks.
3. The section follows a logical flow.
4. There are no typographical or grammatical errors in the proposal draft.
5. There is no extraneous text.

## Part 5: Writing the Abstract

Abstract should provide a concise summary of your proposed research and be approximately 250 words. Abstract is *not* an introduction, it is a *summary* of the entire document and it should present all the major elements of your work in a highly condensed form. In addition to serving as a preface to the thesis proposal, an abstract must be capable of substituting for the whole proposal document when there is insufficient time and space for the full text to be used.

## Part 6: Writing the Conclusion Section

Conclusion section should summarize the proposed research and discuss its possible impact. You should also indicate open issues and directions for further or future work in this area. This section is the last piece of text that your reader will have before the document is completed. Here you want to offer some main points about your work and briefly restate the importance of your work, in terms of the project's research area.

## Summary of Deliverables and Tasks

The dates of the below events in bold have been added to the course calendar.

1. Part 1: An Extended Outline of the Method of Approach Section; Due 11<sup>th</sup> May
2. Part 2: Writing the Method of Approach Section; Due 11<sup>th</sup> May, *about 1000-2000 words*
3. Part 3: An Extended Outline of the Evaluation Strategy Section; Due 13<sup>th</sup> May
4. Part 4: Writing the Evaluation Strategy Section; Due 13<sup>th</sup> May, *about 500 - 1000 words*
5. Part 5: Writing the Abstract; Due 18<sup>th</sup> May, *about 250 words*
6. Part 6: Writing the Conclusion Section; Due 18<sup>th</sup> May, *about 500 - 1000 words*

## Evaluation

You will receive notices in class with the assignments and the deadlines of each section's deliverable. The failure to complete and submit drafts of each section by the stated due date will result in a reduction of your proposal grade. Failure to participate in peer editing process will result in a failed participation grade for that activity.

Specifically, the grade that a student receives on the senior project proposal will have the following components and percentages:

- Part 1 **Expanded Outline of Method of Approach Section** [a CheckMark]
- Part 2 **Written draft of Method of Approach Section** [up to 40%]
- Part 3 **Expanded Outline of Evaluation Strategy Section** [A CheckMark]
- Part 4 **Written draft of Method of Approach Section** [up to 40%]

- Part 5 Written Abstract [up to 10%]
- Part 6 Written Conclusion Section [up to 10%]

### Notes on the Final Proposal Document

Please note: All of the writing sections from Assignments 6, 8 and 10, are to be placed into a single document for your project proposal deliverable for CS580. This implies that your final deliverable will contain the following sections which have been taken from these previous assignments.

- Abstract,
- Introduction,
- Related Works,
- Method of Approach,
- Evaluation Strategy
- Conclusion
- Bibliography

**Extension of the project proposal** The original due date of the project proposal was the 18<sup>th</sup> May, however, it has now been extended to the 20<sup>th</sup> May in order to allow for ample time to complete the writing components. Unfortunately, **this new deadline cannot be extended further.**

### Help?

Please let the instructor know of any questions that you may have. Please use email, Slack or make office-hour appointment slots if you would like to discuss an issue.

### References

- [1] O. Bonham-Carter, “Beagletm: An adaptable text mining method for relationship discovery in literature,” in *Future of Information and Communication Conference*. Springer, 2020, pp. 237–256.