CS 584 Project Midterm Report Guidelines

A comprehensive project midterm report is crucial to ensure that your project is on track to meet the goals and deadlines. It allows us to analyze how well the project is progressing. Also, it helps in identifying any challenges or obstacles that you might be facing. Based on your project proposal, please consider the following suggestions to update each key section. The midterm report should be **4 pages** with the provided project report template.

Blue indicates new added instructions for midterm report based on the project proposal guidelines.

1. **Concise and descriptive title**: The title should reflect the core objectives and focus of your project.
    - New added: You have the option to update your title if needed to reflect your project objective. But it is not suggested to change the project topic.
2. **Introduction**: Provide a concise abstract that offers a brief overview of your project. Highlight the main objectives, methodologies, and anticipated outcomes. Discuss relevant previous work, existing challenges related to your project.
    - New added:
        1) Update any relevant background information or literature review you identified when working on your project.
        2) Summarize the progress you made so far. Include milestones achieved, tasks completed, and any major findings or insights.
        3) Improve and update the introduction section based on your current progress on the project.
        4) Highlight any challenges or obstacles encountered and how they were addressed or plan to be addressed.
3. **Problem formulation:** Formally formulate the task as a machine learning task (e.g., binary classification, seq2eq, multi-class classification, regression, etc.). You can describe this task using equations or definitions if needed.
    - New added: Update and improve the problem formulation based on your progress. Include any necessary notations or equations.
4. **Methods**: Detail the methodologies, techniques, and tools you intend to employ to achieve your project objectives. Outline any innovative approaches you're considering.
    - New added:
        1) Describe more details about the methods, techniques, and implementation used in your project.
        2) Explain the reason that you choose the specific methods and techniques to solve the task, and why they are suitable to solve your task.
        3) Provide the details of any challenges or obstacles encountered and how they were addressed or plan to be addressed.

5. **Datasets and Experiments**: Specify the datasets you will be utilizing in your project. Describe the experiments you plan to conduct, such as the parameters you'll study and the metrics you'll use for evaluation.
    - New added:
        1) Present any data, data preprocessing you have conducted to this point.
        2) Present any experiments, or analyses conducted up to this point.
        3) Discuss and analyze the results and your findings.
        4) Provide your plan for future experiments and analysis.

        For the experiments and analysis to show and report, you can consider the following options.

        1) **Overall performance**: you can report the overall performance with the specific evaluation metrics for your task.
        2) **Performance comparison**: you can consider several baseline methods and compare the performance of the model you select with baseline methods.
        3) **Ablation study** to analyze the importance of different components in your model: If there is any specific components that can be removed or added based on your design, you can use the ablation study to remove it and evaluate the effect of it on the model performance. For example, you can remove the layers in a neural network, specific features or modules and analyze the model performance before and after removing. This analysis is valuable for understanding the impact of specific module on model performance and provide the insights on the model behavior in general.
        4) **Parameter sensitivities**: this is used to assess how sensitive a model's performance is to changes in its hyperparameters. You can identify important hyperparameters in your model, and define a range of their values. For example, in a neural network, you might vary the learning rate, the number of hidden layers, or the number of units in each layer. Then you can train and evaluate the model using different combinations of hyperparameters within the specified ranges. Record the performance metrics for each combination of hyperparameters and analyze the results to understand how changes in the hyperparameters impact the model's performance. You can use tables or plots to organize and analyze the results.
        5) **Illustrative examples**: you can consider identifying representative data samples to illustrate the model performance on the specific examples. For example, if the model provides correct/incorrect results on a data sample, why is the underlying reason.
        6) **Visualization**: you can visualize your results with various plots. For example, you can provide the bar plots of the results for parameter sensitivities. You can get the heatmap to visualize the attention weights in your model.

7) **Any other aspects**: feel free to provide any evaluation and analysis that are suitable for your project.

6. **Project management**: Introduce the members of your project team, including their roles and responsibilities. Outline the timeline of your project, highlighting key milestones and deadlines.
    - New added: Please update this section based on your current progress on the project. What are the contributions of each team member to the current progress? Update the timeline and milestones accordingly.
7. **Key references**: Include a list of essential references related to your project.
    - New added: please update the list of references with the new references you used during the project.