BSAN3212
Deep Learning For Business

Assessment 3 Guidelines

Deep Learning Project Proposal

Instructions

- **Type:** Research proposal
- **Learning Objectives Assessed:**
- **Due Date:** 27 Oct 2023, 3:00 PM (Brisbane time)
- **Weight:** 50% (Individual) 5,000 (+/- 10%) words
- **Task Description:**

Building upon the ideas and concepts explored in your first essay (A1) and journal documenting your completion of two deep learning projects (A2), you will now propose a deep learning project of your own (A3).

This project proposal should aim to address a significant business challenge or opportunity within a specific industry or field that can be tackled using deep learning methods.

Your project proposal should include the following sections: (see next slides)

A3 Deep Learning Project Proposal Structure

1. Introduction
2. Project objectives
3. Methodology
4. Evaluation
5. Timeline
6. Conclusion

A3 Marking rubric (see Blackboard)

- ✓ Introduction = 10
- ✓ Project objectives = 10
- ✓ Methodology = 25
- ✓ Evaluation = 25
- ✓ Timeline = 10
- ✓ Conclusion = 10
- ✓ Required components (i.e., your report includes all six sections above) = 5
- ✓ Report professionalism, structure and quality = 5

Total score = 100

Final grade = 50%

A3 Deep Learning Project Proposal Guidelines

1. Introduction

Provide a brief overview of the challenge or opportunity you will be addressing with your proposed project. Explain why this challenge or opportunity is significant and why deep learning methods are well-suited to address it.

Checklist:

- ✓ Context establishment: The introduction should effectively place the project within a broader context. Does it explain the relevant background information and prior research related to the challenge or opportunity?
- ✓ Challenge or opportunity identification = problem statement: The introduction should clearly define the specific challenge or opportunity that the project will address. Ensure that it is well-defined and not overly vague.
- ✓ Significance statement: Think about the strength of your argument for the significance of the challenge or opportunity. Does the introduction explain why it is important, relevant, or timely? Are potential implications or consequences of addressing this issue highlighted?

A3 Deep Learning Project Proposal Guidelines

1. Introduction (cont.)

Checklist:

- ✓ Deep Learning suitability: Ensure your explanation provided for why deep learning methods are well-suited for addressing the challenge. The introduction should elaborate on the unique advantages of deep learning, such as its ability to handle complex data, learn representations, or adapt to different tasks.
- ✓ Relevance of Deep Learning: The introduction should demonstrate how deep learning methods align with the nature of the challenge or opportunity. Does it show that deep learning is not just a popular trend but a genuinely appropriate approach?
- ✓ Research gap identification: The introduction should identify any gaps in current knowledge or methods, which deep learning can fill. Does it explain how your project will contribute to addressing these gaps?
- ✓ Engagement: Consider the introduction's ability to engage the reader's interest. Does it make the reader want to continue reading your proposal? Is it compelling and motivating?

A3 Deep Learning Project Proposal Guidelines

1. Introduction (cont.)

Checklist:

- ✓ Logical flow: Ensure that the introduction follows a logical flow from the broader context to the specific challenge, and then to the suitability of deep learning methods.
- ✓ Length and focus: Check that the introduction is an appropriate length, neither too brief nor too lengthy, and maintains its focus on the key elements without unnecessary details.
- ✓ Citations and references: Verify that any claims made in the introduction are supported by relevant citations and references. Ensure that the sources cited are current and reputable.
- ✓ Language and grammar: Finally, evaluate the introduction for language proficiency and grammatical correctness. It should be well-written and free from errors.

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2. Project objectives

Define the specific objectives of your [redacted]s should include a clear statement of the problem you will be addressing and the goals you hope to achieve with your deep learning solution.

Checklist:

- ✓ Clarity: The project objectives are clearly defined and specific. The objectives should leave no room for ambiguity or confusion. What exactly does your project aim to achieve? Ensure that the objectives are distinct and well-structured. Each objective should serve a specific purpose and contribute to the overall project. Check for any redundancy or overlapping objectives.
- ✓ Alignment with the problem statement: Check if the stated objectives are aligned with the problem statement presented earlier in the proposal. Ensure that the objectives directly address the problem identified.
- ✓ Measurability: The objectives are measurable and quantifiable. Articulate how you will measure success and what metrics you will use to assess progress.

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2. Project objectives (cont.)

Checklist:

- ✓ Relevance and Significance: You may consider whether the objectives are relevant to the problem at hand and whether achieving them would have a meaningful impact.
- ✓ Feasibility: You should demonstrate that the objectives are achievable within the scope of the project. Ensure that they are not overly ambitious or too narrow in focus.
- ✓ Originality and Creativity: You are encouraged to think creatively when defining objectives. Your innovative solutions or approaches to address the problem are greatly welcomed.
- ✓ Logical flow: Ensure that the objectives are presented in a logical order, with a clear connection between them. They should form a cohesive progression toward solving the problem.
- ✓ Language and presentation: Use concise and professional language to convey the objectives.

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3. Methodology

Describe the deep learning methods to achieve your project objectives. This should include a clear explanation of the algorithms, models, and techniques you will be employing and any data sources you will be using.

Checklist:

- ✓ Alignment with objectives: Check whether your chosen deep learning methods are well-aligned with the project objectives defined earlier in the proposal. Ensure that the methods have the potential to address the identified problem effectively.
- ✓ Choice of algorithms, models, and techniques: Are these choices appropriate for the problem at hand? Have you justified your selections based on the problem's characteristics? Ensure the depth of explanation for your selected algorithms, models, and techniques. You should provide sufficient details on how they work, their core principles, and why they are suitable for the project.

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3. Methodology

Checklist:

- ✓ Data sources and preprocessing: Examine the sources of data mentioned in the methodology. Are they relevant and reliable for the project? You should explain why these data sources were chosen and how you plan to access or collect the data. While it is not mandatory to include code for data preprocessing, you are expected to include information about data preprocessing steps (e.g., data cleaning, normalisation, augmentation, or any other necessary steps), and provide a rationale for these preprocessing choices.
- ✓ Model training, validation, and testing: Outline the process of training deep learning models, including hyperparameter tuning and model evaluation. You should explain how you will measure the performance and progress of the models. You need to describe the validation and testing procedures. Once again, it is not mandatory to include code for these steps.

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3. Methodology (cont.)

Checklist:

- ✓ Clarity and Explanation: Provide a clear and comprehensive explanation of the deep learning methods you use. The explanations should be easily understandable.
- ✓ Ethical considerations: Address ethical considerations related to your data sources, algorithms, and models. Students may discuss potential biases, fairness issues, and privacy concerns and propose mitigation strategies if needed.
- ✓ Computational resources: Acknowledge the computational resources required for your deep learning tasks. Explain how you plan to access or allocate these resources.
- ✓ Alternative approaches: Students are encouraged to consider and explain alternative deep learning methods where applicable. Address associated risks and provide contingency plans for your chosen approach.
- ✓ References: Students must properly cite relevant literature, research papers, tutorials, etc., that support their chosen deep learning methods.

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4. Evaluation

Define the evaluation metrics you will use to assess the effectiveness of your deep learning solution. This should include both quantitative and qualitative metrics, as appropriate.

Checklist:

- ✓ Alignment with the project's objectives and methodology: Ensure that the metrics are relevant to measuring success in addressing the identified problem and methods, as defined in previous sections of the proposal.
- ✓ Quantitative and qualitative metrics: Students should specify metrics that are relevant to the project's nature and provide an explanation of the significance of these chosen metrics. Furthermore, when applicable, students should describe their plans for collecting and analysing qualitative data.
- ✓ Interpretability: Students should discuss how they will interpret the evaluation results. They should provide insights into what the metrics mean in the context of the project's objectives.

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4. Evaluation (cont.)

Checklist:

- ✓ Clarity and comprehensiveness: Provide a clear and thorough description of the evaluation metrics used to assess the effectiveness of their deep learning solution.
- ✓ Baseline comparison: Students are encouraged to compare their deep learning solution's performance to a relevant baseline or existing methods. Students should provide a rationale for selecting the baseline and discuss how their solution surpasses or improves upon it.
- ✓ Visualisations: Students should show their plan to include graphs, charts, or images to help illustrate their evaluation results. Visual representations can enhance the understanding of their findings.
- ✓ References: Students should properly cite relevant resources for the chosen evaluation metrics.

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5. Timeline

Provide a detailed timeline for comple[illegible]roposed project. This should include specific milestones and deadlines for each phase of the project and any potential roadblocks or challenges you anticipate.

Checklist:

- ✓ The proposed timeline aligns with the different phases of the project, including data collection and pre-processing, model development and training, evaluation and iteration, report and documentation. Ensure that each phase is adequately represented.
  - Data collection and preprocessing: Specify when data collection will occur and how long preprocessing is expected to take.
  - Model development and training: Assess the timeline for model development, hyperparameter tuning, and model training. Ensure that it accounts for the complexity of the deep learning models being used.
  - Evaluation and iteration: Check whether the timeline allows for thorough model evaluation, and whether it allows time for model iteration and improvement.
  - Report and documentation: This should include timeline for writing the project report, creating visualisations, and preparing any necessary presentations.

A3 Deep Learning Project Proposal Structure

5. Timeline (cont.)

Checklist:

- ✓ Specific milestones: The timeline includes specific, measurable milestones that mark key progress points in the project. These milestones should serve as indicators of project success and completion. Deadlines for each milestone and phase should be included. Ensure that these deadlines are realistic and take into account the overall project duration.
- ✓ Task dependencies: Consider whether the timeline accounts for task dependencies. Does it show how the completion of one task may impact or lead to the next? Students should address how they plan to manage dependencies.
- ✓ Contingency planning: Anticipate potential roadblocks or challenges and include contingency plans or buffer time in the timeline to address unexpected delays or issues. Allocate time for addressing ethical considerations within the project timeline, especially if the project involves sensitive data or decisions. Timeline may include provisions for monitoring the project's progress and for making updates or adjustments as needed.

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6. Conclusion

Summarise your project proposal, including objectives, methodology, evaluation metrics, and timeline. Discuss the potential impact of your proposed project and how it may contribute to the broader field of deep learning.

Checklist:

- ✓ Summarise the key elements of the project proposal, including its objectives, methodology, evaluation metrics, and timeline. The conclusion should present a clear and easy-to-understand overview without introducing new details.
- ✓ The conclusion aligns with the content presented in the earlier sections of the proposal. It should accurately reflect the project's objectives, methods, and goals as presented throughout the document.
- ✓ Include a brief reflection on the chosen methods, and whether it is effective in achieving the project's goals. Students should acknowledge any lessons learned or limitations encountered.

A3 Deep Learning Project Proposal Structure

6. Conclusion (cont.)

Checklist:

- ✓ Recap the project timeline.
- ✓ Discuss the potential impact of the proposed project. Students should explain how the project's outcomes could benefit the intended audience or the broader field of deep learning.
- ✓ Discuss how the project may contribute to the advancement of deep learning. This could include insights, novel techniques, or solutions developed.
- ✓ Reflect on any ethical considerations or implications of the project, and mention these in the conclusion, especially if they are relevant to the project's impact.
- ✓ Suggest potential areas for future work or further research that can build upon the project's findings or address any limitations.
- ✓ Engage the reader and leave a lasting impression. It should highlight the significance and relevance of the project.

A2 Coding Project Journal Structure

Other notes:

- Appendix, additional tables, charts and other visualisations can be added to the report as supporting materials (not included in the word count) – however, they should be concise and highly relevant to the main text.

Submission Checklist

- ❑ Title page including title of the assignment, student name and student number, and assignment word count.
- ❑ Table of Contents page.
- ❑ The page number is included as a footer on each page.
- ❑ Report style format (with subheadings, e.g. "1.0 Introduction") is used.
- ❑ 1.5 spacing, with 2.5cm margins.
- ❑ Consistent font throughout, including headings.
- ❑ The essay is within the 5,000-word limit (+/- 10%; references and appendices are not included in the word count).

Submission Checklist

- ❑ APA 6/7th referencing is followe[illegible]ntly across all references (in-text and in the reference list).
- ❑ The essay has been proofread and checked for spelling, and grammatical errors.
- ❑ Understand the marking rubric.
- ❑ The essay is submitted on time.
- ❑ Similarity check (via Turnitin) has been reviewed.
- ❑ The essay is written in English.