Plan Overview

A Data Management Plan created using UCT DMP

Title: Justification-Based Explanation with Syntax Splitting

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Template: UCT Student Generic DMP

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Project abstract:

Defeasible reasoning is a type of non-monotonic reasoning that supports the conclusion of general knowledge while allowing for exceptions; it enables the withdrawal of earlier inferences when new, conflicting information arises. Just as crucial as concluding is the ability to explain why a system reached a particular conclusion based on explicit knowledge—this explanatory capability is essential in symbolic reasoning systems. In this study, we implement and assess algorithms for defeasible entailment and explanation that are grounded in inference operators from the KLM framework, developed by Kraus, Lehmann, and Magidor. Our work concentrates on three key variants: Rational Closure, Lexicographic Closure, and Relevant Closure. A primary objective is to develop justification algorithms specifically for Lexicographic Closure, and potentially for Relevant Closure as well. Our optimised implementations will build upon the foundational work of Chama and Everett et al. For a thorough evaluation, we plan to design simple yet effective generators that can produce defeasible knowledge bases in propositional logic. Additionally, to make our results more accessible and interpretable, we will develop a web-based tool that visually presents the outcomes of our algorithm evaluations. Syntax splitting is a characteristic of certain inductive inference operators that allows reasoning to focus only on the portions of a defeasible knowledge base that involve atoms appearing in a specific query. For syntax splitting to apply directly, the conditionals in the knowledge base must be syntactically disjoint, meaning they do not share any atoms. However, this strict requirement is often impractical, as real-world conditionals frequently overlap. Recent research addresses this limitation by introducing conditional syntax splitting, a relaxed version of the concept inspired by conditional independence in probability theory. It has been demonstrated that both Rational Closure and Lexicographic Closure uphold this property. Furthermore, conditional syntax splitting has been linked to several established principles in the field of non-monotonic reasoning, such as the drowning effect, enriching our understanding of how these systems handle inference in complex knowledge bases.

ID: 8841

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Justification-Based Explanation with Syntax Splitting - Student Outline DMP

1. General guidelines

PURPOSE OF THIS TEMPLATE
The purpose of the Outline DMP is to indicate your initial plans for how your data will be collected, shared and stored, and to give you a chance to think about these data-focused aspects of the research process. As your begin doing your research, your data process may change, and it is perfectly acceptable to change your data management plan to accommodate the changes in your research process.
Indicate below that you understand the purpose of completing this Outline DMP template.

- I understand the Outline DMP template is a projection of my anticipated data management planning requirements and should be updated as my project develops.

2. Authors and supervisors

PROJECT NAME
Replicate the title of your project, dissertation or thesis exactly as it appears in your proposal document.

Justification-Based Explanation with Syntax Splitting

PERSONAL DETAILS
Indicate the name(s) and student number(s) of the student(s) who will be involved in this project, dissertation or thesis.

Chipo Hamayobe - HMCYHI001

SUPERVISOR(S) DETAILS
Indicate who will supervise this project, dissertation or thesis. If you do not yet have a supervisor, leave this section blank.

Professor Thomas Meyer

3. Data Collection/Generation

ORIGINAL DATA
Indicate whether you will collect or produce original data for your study. If yes, briefly describe the type of data and how you plan to manage it.
If you are unsure at this time, indicate what you think you are most likely to collect. If you are not intending to gather or collect your own data, declare that here.

- I do not intend to collect original data

DATA RE-USE
Indicate if you intend to re-use existing data, either from online searches or from datasets provided by your supervisor, lab, or funder.
If you are not intending to re-use existing data, declare that here. Also note any restrictions that apply to the re-use of data.

- I do not intend to reuse existing data.

DATA SENSITIVITY & SECURITY

Indicate whether your research data may contain sensitive, personal, disclosive, or otherwise at-risk information.

If yes, briefly describe the type of sensitivity involved and the steps you will take to secure and control access to your data.
If you are unsure at this stage, indicate what you think is most likely. If your data is not sensitive, declare that here and state how you will still ensure responsible storage.

- My data is sensitive or at-risk (described below).
- My data is not sensitive or at-risk.

4. Data Storage

DATA SIZE ESTIMATE

Indicate the estimated size of your completed dataset, and indicate whether or not you will need to access additional data storage facilities. If such storage is not provided by your unit or department, you may need to factor in the cost of purchasing additional storage space.

- 20GB or less

DATA BACKUPS

Indicate how you plan to ensure your data is secure and retrievable in case of errors or hardware failure. Describe what procedures you will put in place to back-up copies of your data and where they will be stored.

- I intend to backup my data using a service provided by UCT (UCT GoogleDrive, UCT OneDrive, Netstorage, ZivaHub etc.).

5. Data Sharing/Publication

DATA SHARING

According to UCT's Research Data Management policy, research data should be made open by default, with provisions for making it closed in specific cases (such as ethical considerations or potential commercialisation).
Indicate whether you plan to publish your research data.
• If yes: say where you will publish it and what licence (e.g., Creative Commons) you will use.
• If no: explain why, and refer to any ethical issues, commercial or patent intentions, or data-use agreements that prevent publication.

- I intend to share my data (details below).

DATA DESCRIPTION

What information will you include to help others understand and use your dataset?
(For example: a short description of your study, explanations of variables, survey questions, or keywords. These are known as metadata.)

The completed dataset will be accompanied by keywords, a short description taken from my dissertation abstract and relevant paragraphs on the data process taken from my methods section.

6. Budget

BUDGET

Indicate any costs specifically relating to the management and curation of your data, such as purchasing additional storage space, digitisation of physical media, data storage or curation charges, and data audits. Most student research will be able to make use of free options provided by UCT and will not have to budget for data costs.

- I do not anticipate any data costs as my data is less than 10GB, and I will be using a storage system provided by UCT (UCT GoogleDrive, UCT OneDrive, Netstorage, ZivaHub, etc.) to curate my data.