Peer Review

Case Based Reasoning

Paper ID: case_based_reasoning_7

What the Paper Presents

The paper presents and explains the Case-Based Reasoning (CBR) method, with extensive focus on case similarity. The method concludes a system where prior case knowledge can solve new similar cases, thus improving future problem-solving. CBR has an active and advancing research community, and proposed implementations can be achieved using several classical machine-learning methods.

Relevance

1 Bad	**2** Mediocre	**3** Good ✓	**4** Great	**5** Excellent

Overall, the paper does an excellent job explaining many topics in CBR and its similarity problem in a thorough and easy-to-understand manner. However, the paper is unclear whether its main focus is on CBR as a whole or its similarity problem. In the introduction, the CBR method is introduced with further in-depth explanation in the foundational section. Still, most of the paper hereafter focus on its similarity problem. When explaining their choice of topic in the fourth section, the authors state that "We choose therefore to base the topic of Similarity in CBR".

Technical Soundness

1 Bad	**2** Mediocre	**3** Good ✓	**4** Great	**5** Excellent

The case-base concept is easy to grasp from the walk-through of a CBR routine's cycle, even though the explanation seems rushed towards the end. Moreover, the authors support their explanation with a well-known example that they also reference throughout the paper. Further referencing a singular example is helpful, as the reader is familiar with it and will thus understand new concepts in a known context. However, an original example by the authors would support their credibility about the method. The paper has some vague and lacking explanations *if the paper cover CBR as a whole*. For example, the explanation of the *Vocabulary* is shallow, and does not convey a concrete description nor how it functions. Also, as adaption is a significant component in CBR, its brief description is to insignificant for the paper. In contrast, if the paper's focus is primarily on similarity problem, then its CBR coverage is too extensive.

Clarity and Presentation

1 Bad	**2** Mediocre ✓	**3** Good	**4** Great	**5** Excellent

The paper's most prominent weakness is its convoluted structure, lack of clarity, and unconventional academic phrasings. Firstly, sub-sections would significantly improve the paper's readability. In its current format and use of retrospective pointers, the paper can feel exhaustive and seem inadequately planned, especially with multiple redundant recurrences explaining the same concepts. Also, the paper is not segregated into the proposed structure. Instead of discussing improvements or alternative methods, it extends its foundation about similarity into the third section. Moreover, similarity is also discussed further into the section about current applications. The paper is structured so that its introduction is not fully understood until reading the foundations section. As the author's state: "...in the hopes that the reader can, now, organize the mess from introduction...". Also, to readers, apologizing for the paper being messy makes the authors feel insecure about their writing. This, in turn, lowers the trust between the reader and the author.

This is also not the only unconventional phrasing. In the introduction, the authors support their definition by using a hypothetical thought experiment, suggesting that the person might be under the influence of psychedelic mushrooms. With presumably humorous intent, the statement is not suitable nor appropriate for academic writing. As for clarity, the text favors lengthy and abstract topic descriptions instead of a short and concise approach. While some explanations require a broader context to be adequate, some explanations in the paper are exhaustive and include redundant material that is not relevant. Instead, these added contexts make it harder for the reader to extract essential information.

That being said, the paper has good word-variations, and also emphasizes important keywords throughout the paper. Yet, there are grammatical mistakes throughout, especially comma-errors.

Applications and Usage of the Method Described

1 Bad 	**2** Mediocre	**3** Good	**4** Great	**5** Excellent

The paper does not present a concrete implementation of the method, and instead focus on how recent advancements in the field improves on the method. While this is an interesting section, the grading is a result of this being a required topic to cover.

Suggestions for Further Improvements

The paper will benefit from an in-depth grammatical review, and online tools such as *Grammarly* can assist the process. Also, the authors should remove inappropriate academic phrasings such as "Neat!" and "CBR should have excited and filled reader's imagination with exhilarating possibilities". References to internal course-related information should also be removed, such as the reference to available information in Blackboard. To improve confidence in the authors, they should also remove modest statements, such as apologies; statements like "What we have failed to note..." and "but (we) cannot shake the feeling that we have left more unanswered questions than we started with." has a self-deprecating impact and reduce confidence. The paper should also be more explicit in what it covers.

In the case of a *CBR*-focused paper, the foundation section should be concise and explain most of the CBR topics. Similarity should be explained at the same depth as other important topics, such as the *vocabolary* and *adaption*.

In the case of a *Similarity*-focused paper, the introduction could briefly present the CBR method while the foundation section covers the similarity problem.

Other specific improvements:

- An example of an interpretations could be helpful when discussing the *Vocabulary*
- Improve ambiguity: when discussing performance, *this* is very ambiguous when discussing how *this can be achieved*.
- When presenting the formulas for computing similarity, the sim_i function is not explicitly defined. However, kNN for similarity estimation is presented later in the next section. This estimation technique could be introduced before the formulas.
- Instead of referencing a source as *The textbook on CBR*, do reference it as a proper source in the bibliography.
- When discussing how modern approaches yield results not sufficed by the classical CBR approach, do include an example.
- Position table 2 after the modern terms' definition.