Review of: "Harnessing Self-Supervision in Unlabelled Data for Effective World Representation Learning in AI Models"

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Potential competing interests: No potential competing interests to declare.

This work presents empirical analysis on the efficacy of self-supervised learning, using SimCLR as a base model.

The objective of this paper is clear, and the research methodology is valid though the experiments were very limited.

However, as the author mentioned in Introduction that one of the open challenges in understanding Self-supervised learning is the unclarity in rigorous mathematical formalization of why self-supervised learning works, the reviewer fails to find new insights provided in this paper about this challenge. The reviewer understands that building this kind of mathematical formalization is difficult. However, the author needs to at least argue about some directions that can be pursued to achieve this objective.

There are also some points that need to be clarified to improve the readability and the technical quality of this paper.

1. About the experiment procedure: The author has 10k labeled images across 100 object categories (classes). This means that for experiment b, 1% covers only 100 data over 100 objects categories, that makes only 1 example per category. In “The study procedure point 3] in pg. 5, why are there 100 examples per class? Please clarify this point.
2. In the experiments for an extremely low availability of labelled data, the author utilized 10 examples per class for supervised training. 10 examples per class covers 10% of the whole labelled data. It is interesting to observe the critical percentage of the availability of the labelled data until the accuracy of the supervised learning is surpassed by the self-supervised learning. This analysis will strengthen the insight about the effective usability of the self-supervised mechanism.