REPORT

# Title: Predicting citation counts based on deep neural network learning techniques

# Introduction:

In the realm of scientific research, the evaluation and quality assessment of research papers have become increasingly crucial due to the surge in published scientific works. One of the key metrics for assessing the impact and quality of a scientific paper is its citation count. This report delves into a novel method proposed for predicting the long-term citation counts of scientific papers using deep neural network learning techniques, as detailed in the article "Predicting Citation Counts Based on Deep Neural Network Learning Techniques" by Ali Abrishami and Sadegh Aliakbary.

# Short Summary:

The article presents a method for predicting the long-term citation count of scientific papers based on the citation patterns in the early years after publication. This approach employs artificial neural networks, specifically designed to handle sequence prediction tasks. The method leverages citation data from the first few years post-publication to forecast citations over an extended period, from the 5th to the 15th year. The authors compared their model's performance against several state-of-the-art methods, demonstrating superior accuracy in both yearly and total citation predictions.

# Argument/Critical Analysis:

The authors successfully address a significant challenge in scientometrics: accurately predicting the future impact of scientific papers. Their approach is innovative, utilizing deep learning techniques that have proven effective in various domains but are relatively new in citation prediction. By focusing on the sequence-to-sequence model and recurrent neural networks (RNNs), the authors manage to capture the temporal dynamics of citation patterns effectively.

However, the study has some limitations that warrant further discussion. Firstly, the reliance on citation data from only the first few years may not fully capture the long-term impact of papers with delayed recognition. The phenomenon of "sleeping beauties" in science, where papers gain significant attention years after publication, is not adequately addressed. Additionally, the exclusion of other potentially influential factors, such as author reputation, journal impact factor, and the paper's content, might limit the model's predictive power.

Moreover, while the neural network approach shows promise, it requires substantial computational resources and expertise in deep learning, which might not be readily available to all researchers and institutions. The method's dependency on a large dataset for training also raises questions about its applicability in fields with fewer publications.

# Conclusion:

The article by Abrishami and Aliakbary contributes significantly to the field of scientometrics by introducing a sophisticated method for predicting long-term citation counts using deep neural networks. While the proposed model demonstrates superior accuracy compared to existing methods, its limitations and the computational demands highlight areas for further research and development. Future work could explore integrating additional predictive features and refining the model to account for the delayed impact of some scientific works. Overall, the study marks a promising advancement in the predictive analytics of scientific impact, offering valuable insights for researchers, institutions, and policymakers.