

# Co-Citation Prediction with Graph Networks and Transformers

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## Abstract

*A vast number of academic papers are published each year. Especially in fast-paced disciplines like computer science, it is impossible for researchers to develop a comprehensive understanding of the landscape. We aim to build a model to predict the likelihood of two papers being co-cited by subsequent work. This model can help researchers parse through literature to identify novel research directions. We will leverage language models to represent each paper's content and graph convolutions to represent citation networks.*

## 1. Introduction

(5 points) What did you try to do? What problem did you try to solve? Articulate your objectives using absolutely no jargon. (5 points) Who cares? If you are successful, what difference will it make? (5 points) What data did you use? Provide details about your data, specifically choose the most important aspects of your data mentioned here: Datasheets for Datasets (<https://arxiv.org/abs/1803.09010>). Note that you do not have to choose all of them, just the most relevant.

## 2. Related Work

(5 points) How is it done today, and what are the limits of current practice?

## 3. Data

[1]

## 4. Methods

(10 points) What did you do exactly? How did you solve the problem? Why did you think it would be successful? Is anything new in your approach? (5 points) What problems did you anticipate? What problems did you encounter? Did the very first thing you tried work?

## 4.1. Architecture

### 4.1.1 Transformer Encoder

### 4.1.2 Graph Convolutional Network

### 4.1.3 Regression Head

## 4.2. Evaluation

## 5. Results

(10 points) How did you measure success? What experiments were used? What were the results, both quantitative and qualitative? Did you succeed? Did you fail? Why? Justify your reasons with arguments supported by evidence and data. Make sure to mention any code repositories and/or resources that you used!

## 6. Discussion

## References

- [1] Jie Tang, Jing Zhang, Limin Yao, Juanzi Li, Li Zhang, and Zhong Su. Arnetminer: extraction and mining of academic social networks. In *Proceedings of the 14th ACM SIGKDD international conference on Knowledge discovery and data mining*, pages 990–998, 2008. 1