ASYNCHRONOUS NEURAL NETWORKS FOR LEARNING IN GRAPHS

A NOTE

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June 19, 2022

This paper [1] introduces asynchronous message passing (AMP), where nodes interact asynchronously by exchanging and reacting to individual messages. If we look at the dynamics of one node in isolation, it receives a sequence of messages which can be used to update its state and (possibly, not always) emit a sequence of messages. RNN model can be used to processed the sequence information. It can be proved that (i) AMP can simulate synchronous GNNs and that (ii) AMP with message delays can go beyond all Weisfeiler-Lehman tests and solve any isomorphism problem.

References

[1] Lukas Faber and Roger Wattenhofer. Asynchronous neural networks for learning in graphs. *arXiv preprint arXiv:2205.12245*, 2022.