

COP5615 – Fall 2019

Project 2 – Gossip Simulator

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Implementation Summary:

Actors are initiated and for each actor, its neighbors are found based on the topology and added to the actor's list of neighbors. The master process then goes and seeds one of the actors at random with the rumor. This actor periodically forwards the rumor to its neighbors. Every actor that receives the rumor behaves similarly and thus convergence is achieved. In the case of an isolated node, the node terminates itself.

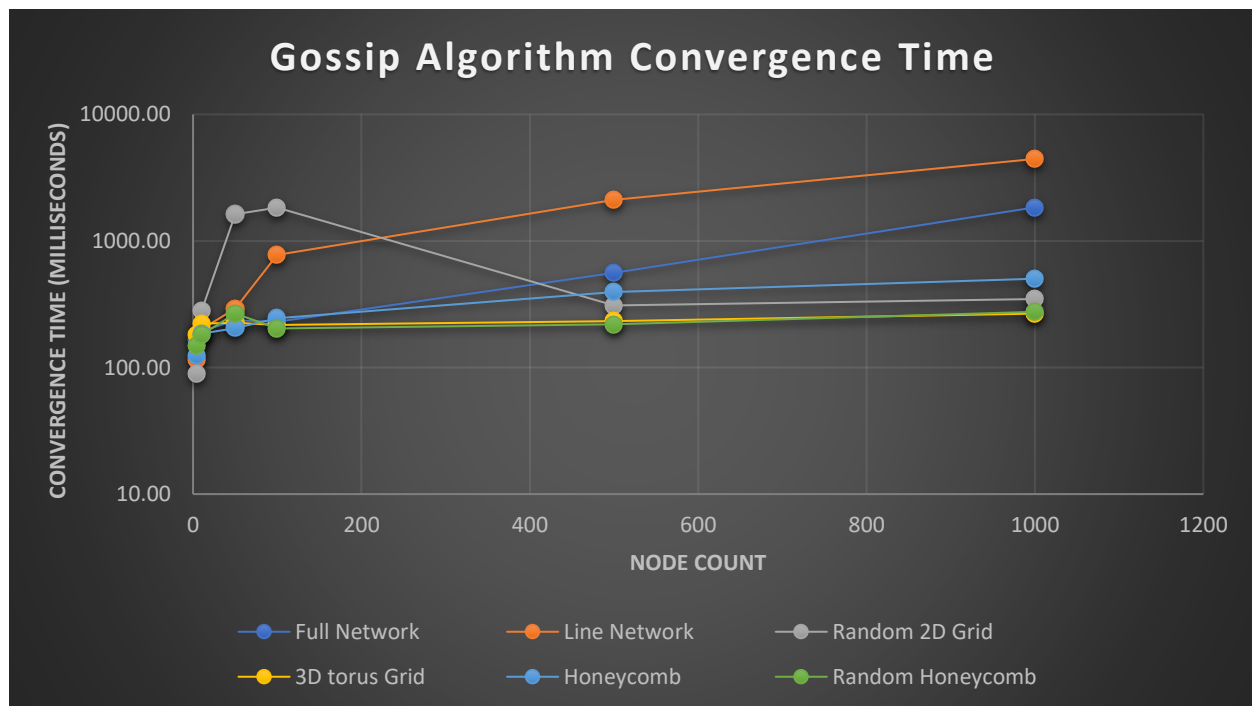


Figure 1: Gossip Convergence for Different Topologies

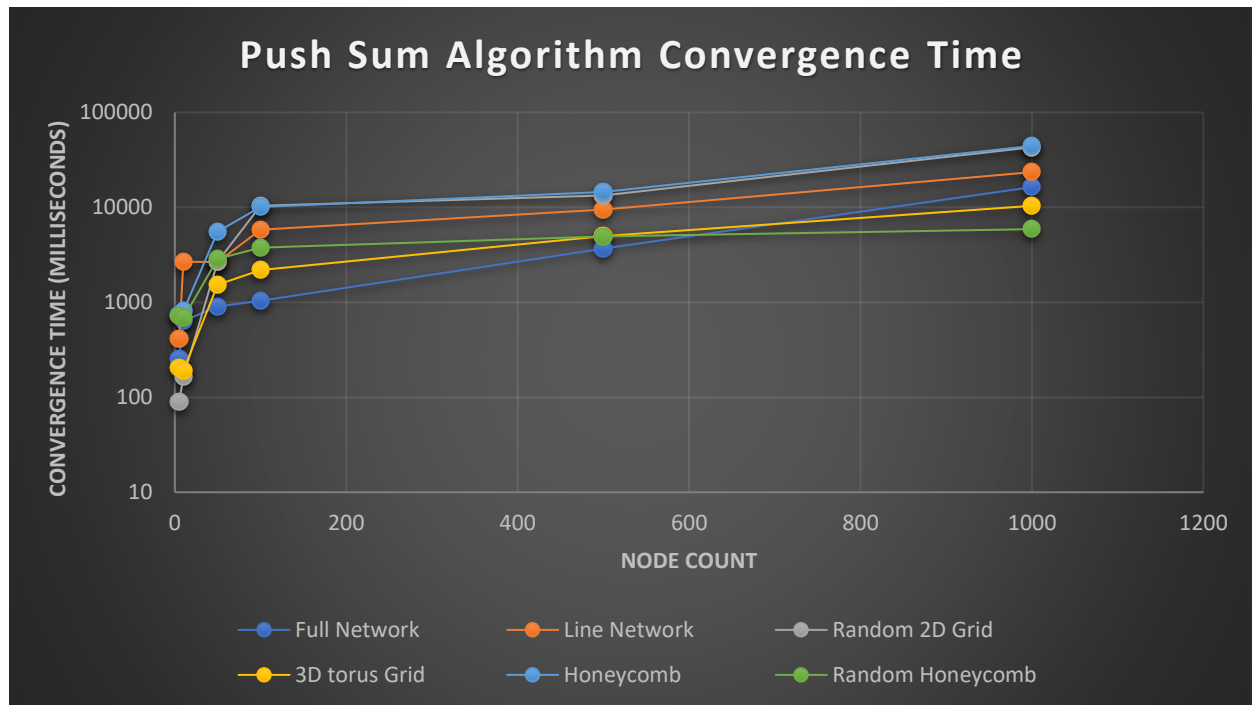


Figure 2: Push-Sum Convergence for Different Topologies

Time measurement:

The in-built API provided by the time module was used to measure the convergence time. The time measurement starts after the topology is built and before the master sends the first rumor to an actor. It ends immediately after convergence is achieved.

Findings:

1. In case of both the algorithms, honeycomb with a random neighbor converges faster compared to all the other topologies.
2. Random 2D grid topology performs better as the network size increases. For smaller networks, the performance is degraded. This can be since for smaller networks the nodes are not well connected.
3. The convergence criteria for push sum is difficult to achieve. Therefore, the impact of different topologies on convergence time is dampened when performing push sum algorithm