

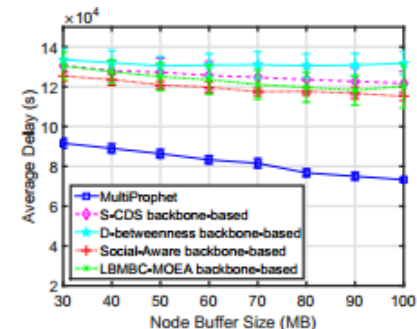
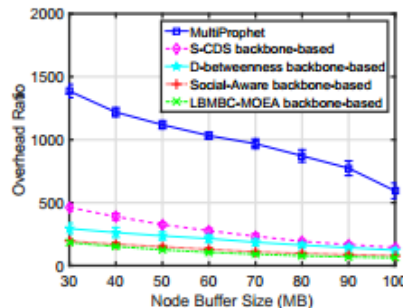
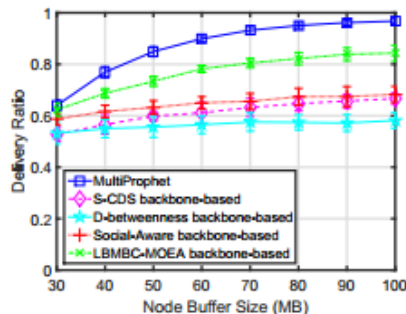
Robust Load-Balanced Backbone- Based Multicast Routing in Mobile Opportunistic Networks

Di ZHANG, Dong ZHAO, Huadong MA

Frontiers of Computer Science, DOI: [10.1007/s11704-022-1288-1](https://doi.org/10.1007/s11704-022-1288-1)

Problems & Ideas

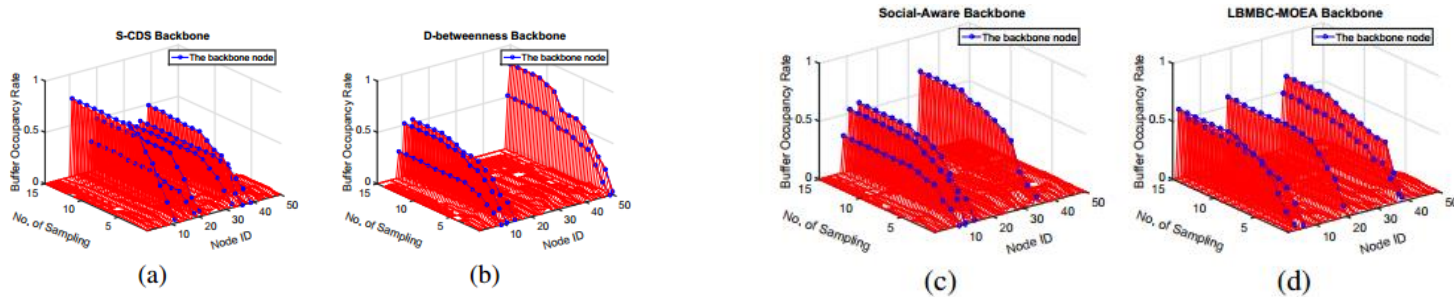
- Problems of conventional multicast routing algorithms:
 - The conventional algorithms take all nodes in an MON as potential relay nodes of the multicast message, while they do not exclude the nodes with poor ability to deliver messages in advance.
 - The complexity of the previous algorithms and the network overhead can be further reduced.
 - Using backbone can improve the performance of routing algorithms, but the existing algorithms do not consider multicast scenarios in MONs and ignore the impact of node buffer size constraints on backbone-based routing algorithms.
- Ideas: Propose a load-balanced backbone-based multicast routing algorithm in MONs, and increase the robustness of multicast routing algorithm by designing a local backbone maintenance algorithm.



Comparisons of different backbone-based routing algorithms. Left: Delivery ratio on Infocom06; Middle: Overhead ratio on Infocom06; Right: Average delay on Infocom06.

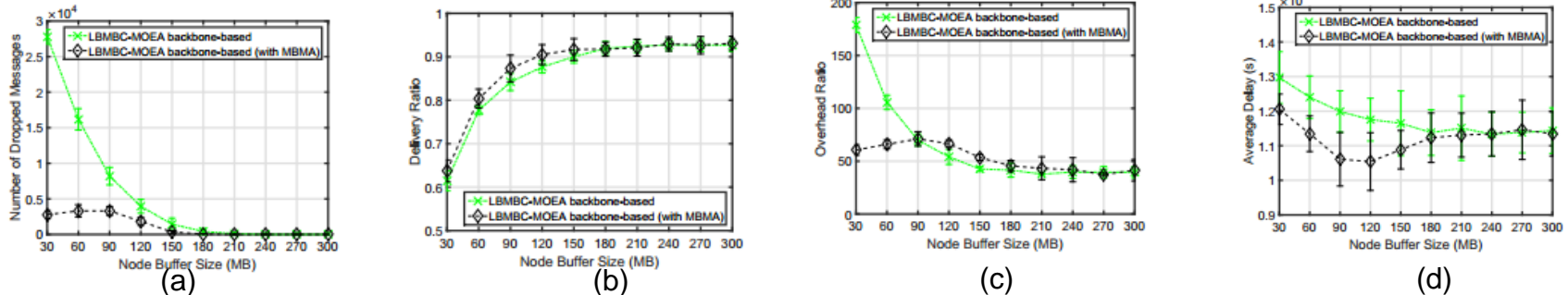
Main Contributions

- Contributions:
 - Transform the construction of multicast backbone into a multi-objective optimization problem, and propose a multi-objective evolutionary algorithm-based backbone construction algorithm;



The buffer occupancy rate of backbone nodes generated by different backbone construction algorithms

- To increase the robustness of the backbone-based routing scheme, we propose a localized multicast backbone maintenance algorithm (MBMA);
- Propose a robust load-balanced backbone-based multicast routing scheme in MONs.



The results of the algorithm with and without MBMA algorithm . (a) The number of dropped messages on Infocom06; (b): Delivery ratio on Infocom06; (c): Overhead ratio on Infocom06; (d): Average delay on Infocom06.