

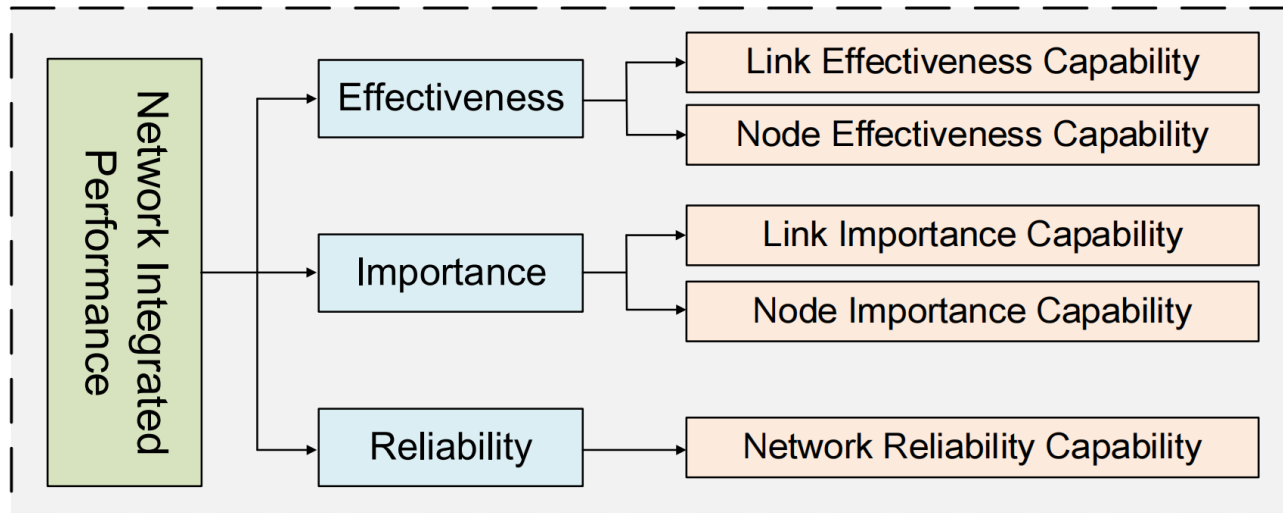
A network integrated performance evaluation method based on multi-attribute decisions of topology and traffic

Shengyuan QI, Lin YANG, Linru MA, Yuyang ZHOU,
ShanqingJIANG, Lianxiao MENG, Guang CHENG

Frontiers of Computer Science, DOI: [10.1007/s11704-025-40980-7](https://doi.org/10.1007/s11704-025-40980-7)

Problems & Ideas

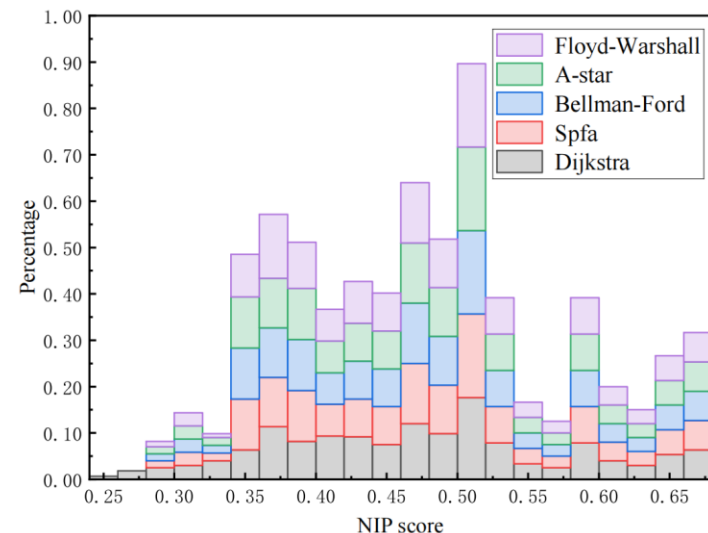
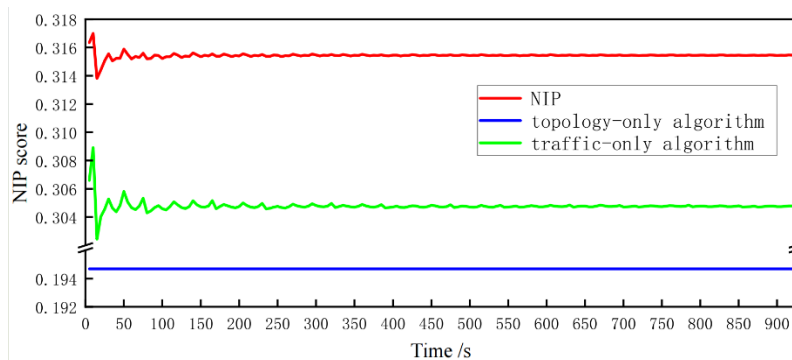
- The Problems of Traditional Network Evaluation:
 - Indicator singularity: Traditional measurement methods often only focus on a single or very few indicators.
 - Perspective limitations: Another limitation of traditional measurement methods is their narrow perspective, typically only measuring from the perspective of traffic analysis or network topology.
- Ideas: A network integrated performance evaluation method based on multi-attribute decisions of topology and traffic



The proposed evaluation algorithm assesses network effectiveness, importance, and reliability by integrating multiple dimensions. This multi-metric approach ensures adaptability across various network environments.

Main Contributions

- Contributions:
 - This paper presents a novel network performance evaluation method that integrates topology and traffic through multi-attribute decision-making;
 - It assesses the effectiveness, importance, and reliability of nodes and links, adapting to traffic changes;
 - method validated through simulations and attack tests, demonstrating its practical relevance for network management and security.



Results. Left: Comparison of Network Performance; Right: NIP evaluation results of different algorithms.