Supplementary Information for "*SPP-CNN: An Efficient Framework for Network Robustness Prediction*"

Chengpei Wu, Yang Lou, Lin Wang, Junli Li, and Guanrong Chen

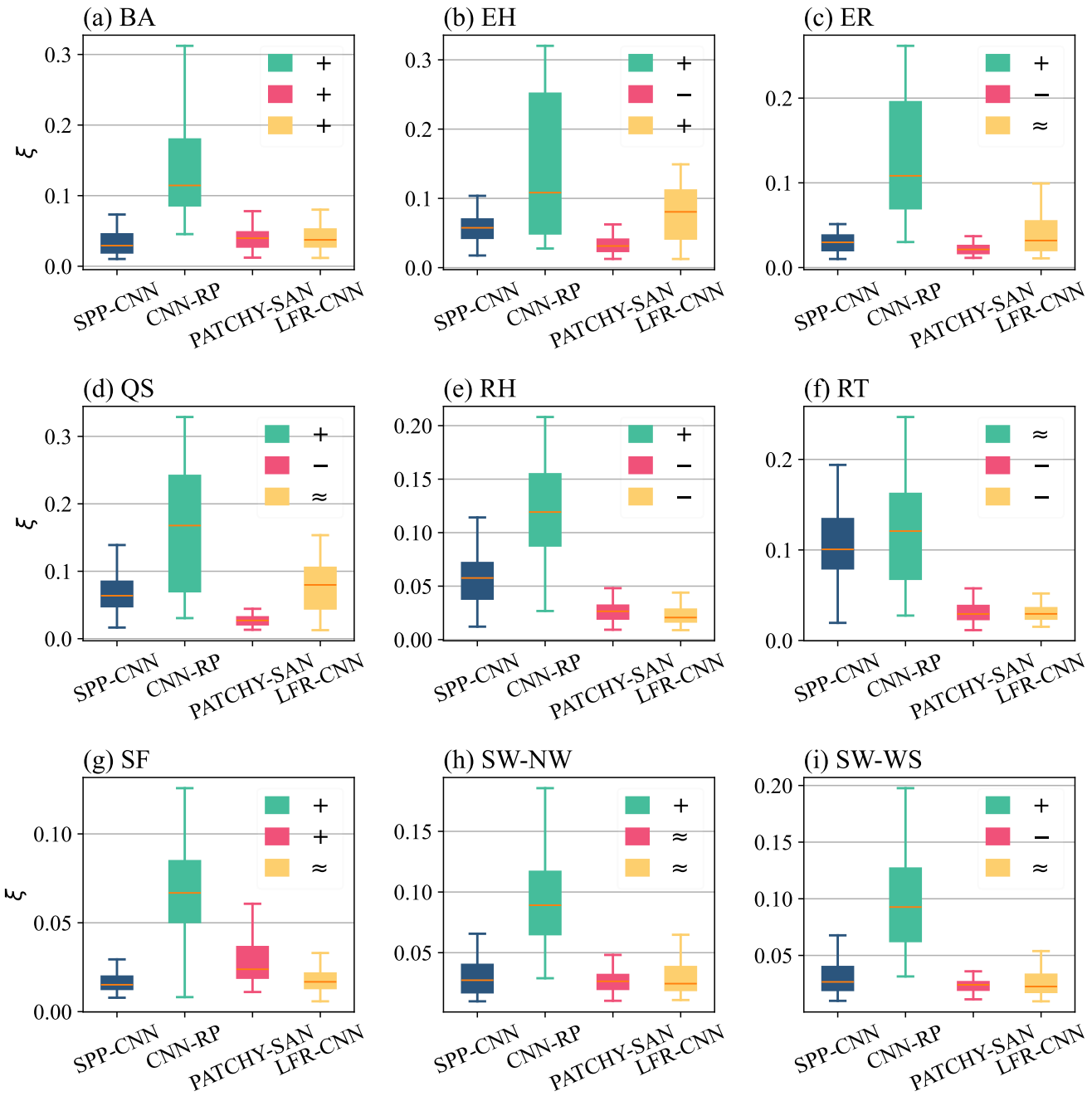


Fig. S1: Boxplots of prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN. Networks of S_1 and $N_a \in [700, 1300]$ are used for both training and test datasets. Connectivity robustness of directed networks under maximum-degree node attacks is predicted.

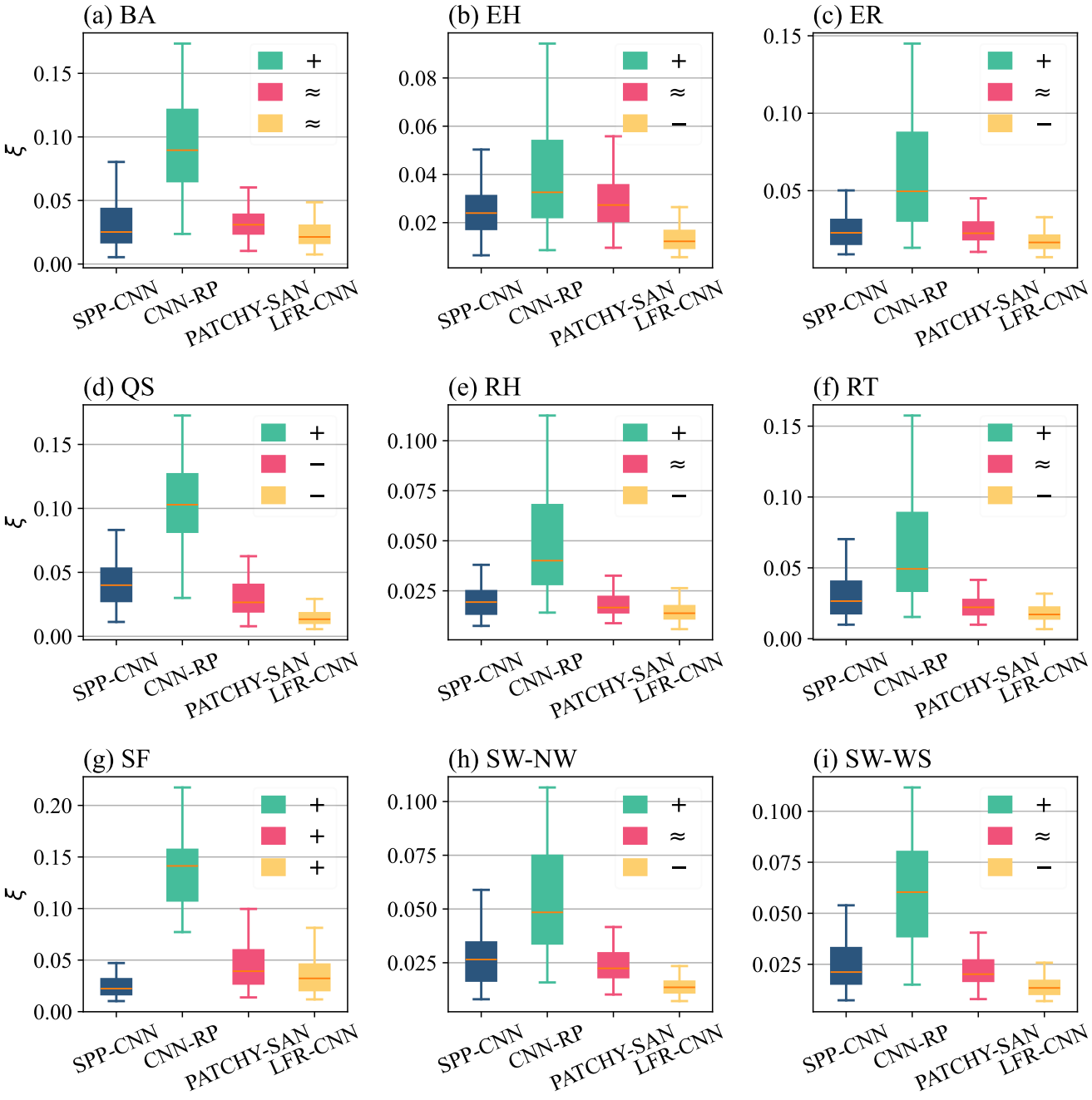


Fig. S2: Boxplots of prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN. Networks of S_1 and $N_a \in [700, 1300]$ are used for both training and test datasets. Controllability robustness of directed networks under random node attacks is predicted.

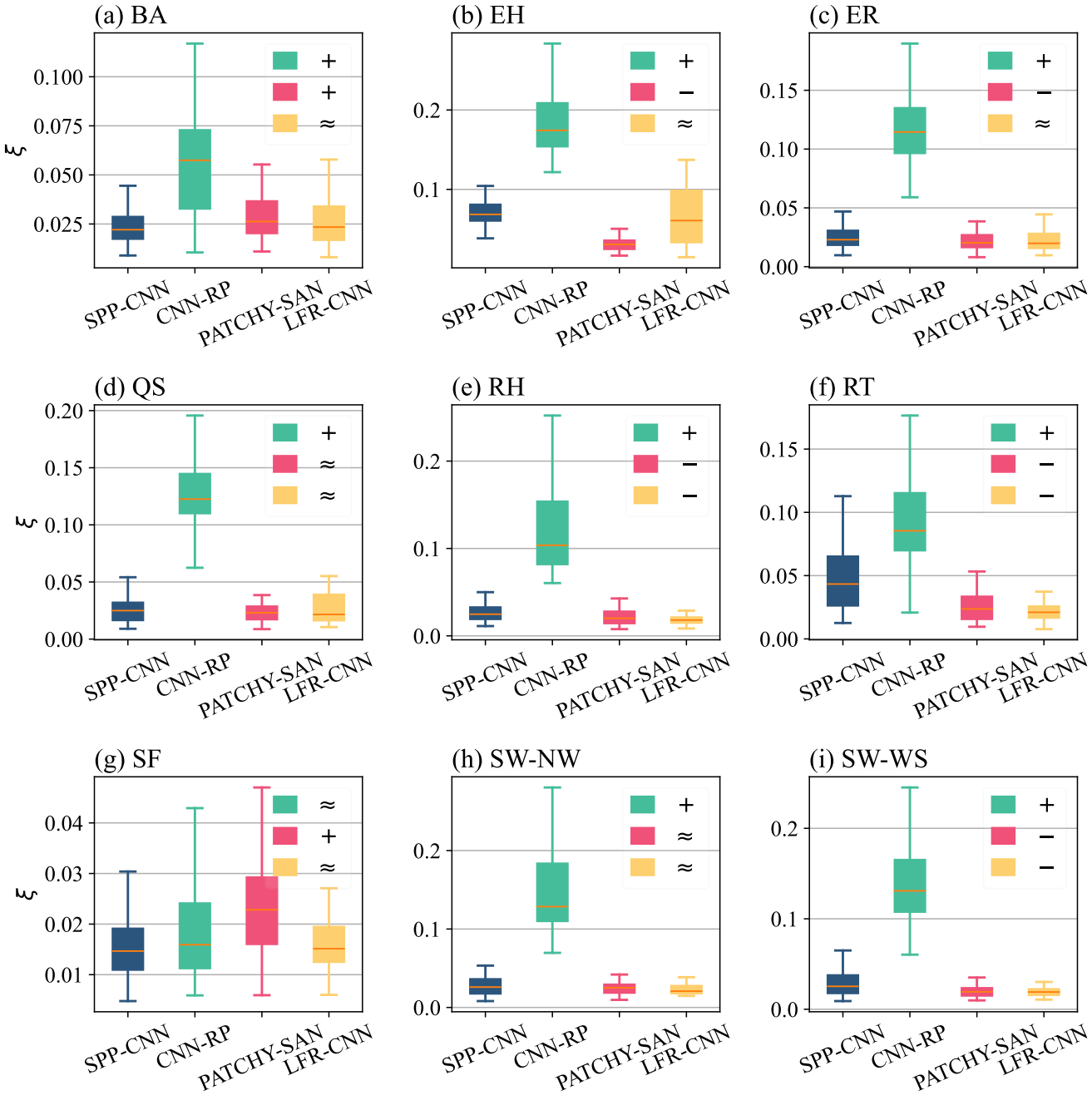


Fig. S3: Boxplots of prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN. Networks of S_1 and $N_a \in [700, 1300]$ are used for both training and test datasets. Connectivity robustness of undirected networks under maximum-degree node attacks is predicted.

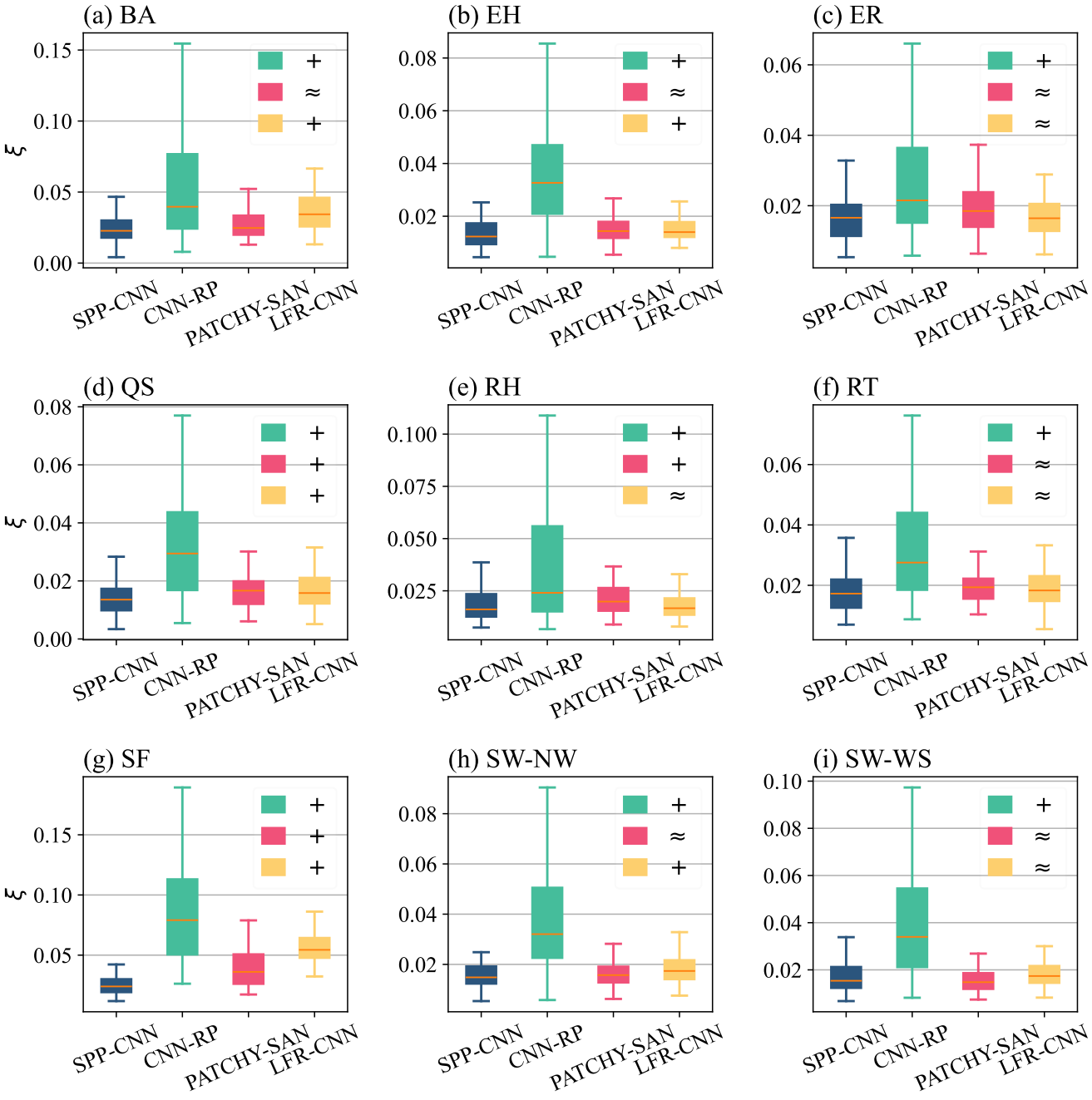


Fig. S4: Boxplots of prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN. Networks of S_1 and $N_a \in [700, 1300]$ are used for both training and test datasets. Controllability robustness of undirected networks under random node attacks is predicted.

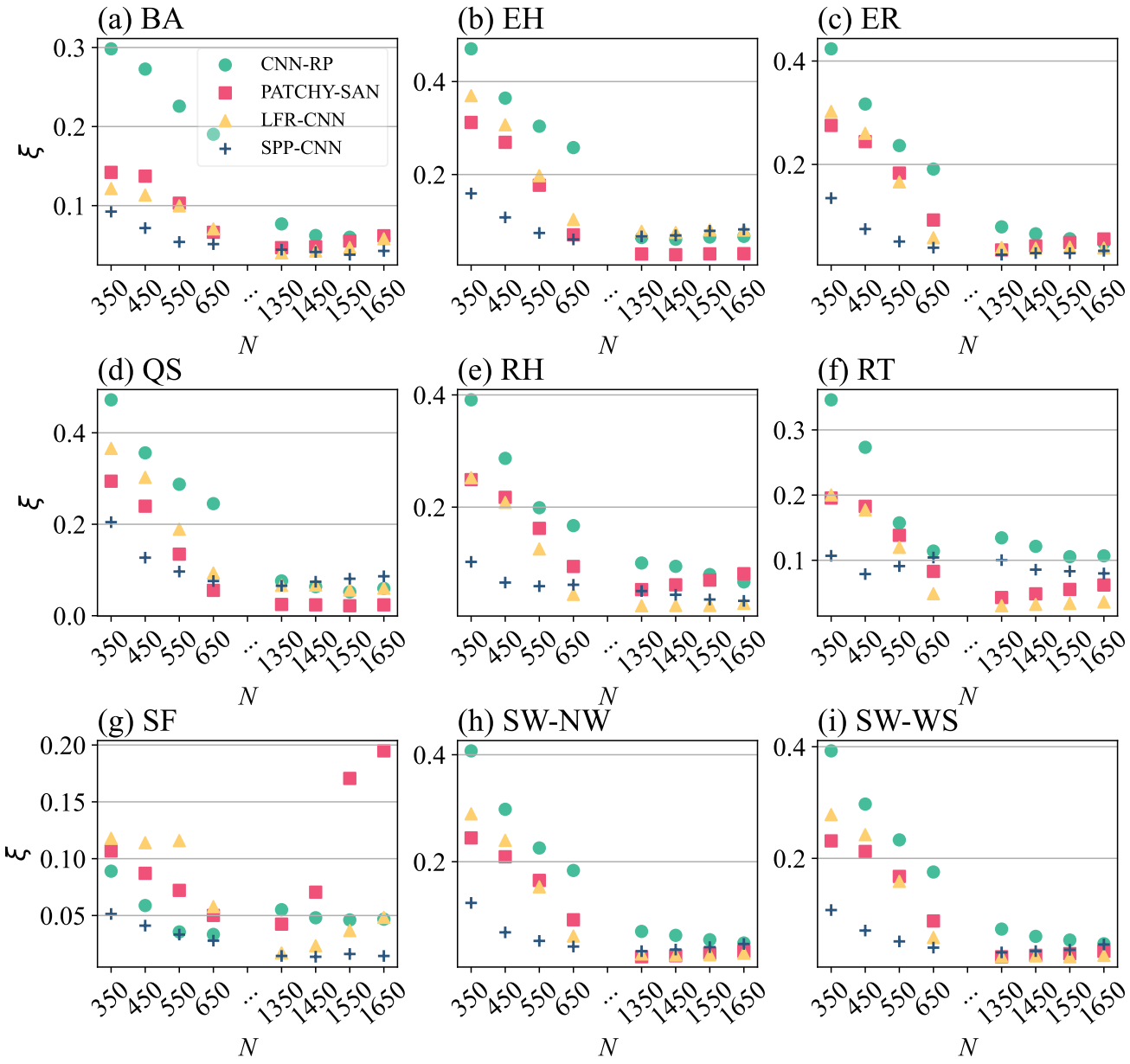


Fig. S5: Prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN for unseen network sizes (UNS). Connectivity robustness of directed networks under maximum-degree node attacks is predicted.

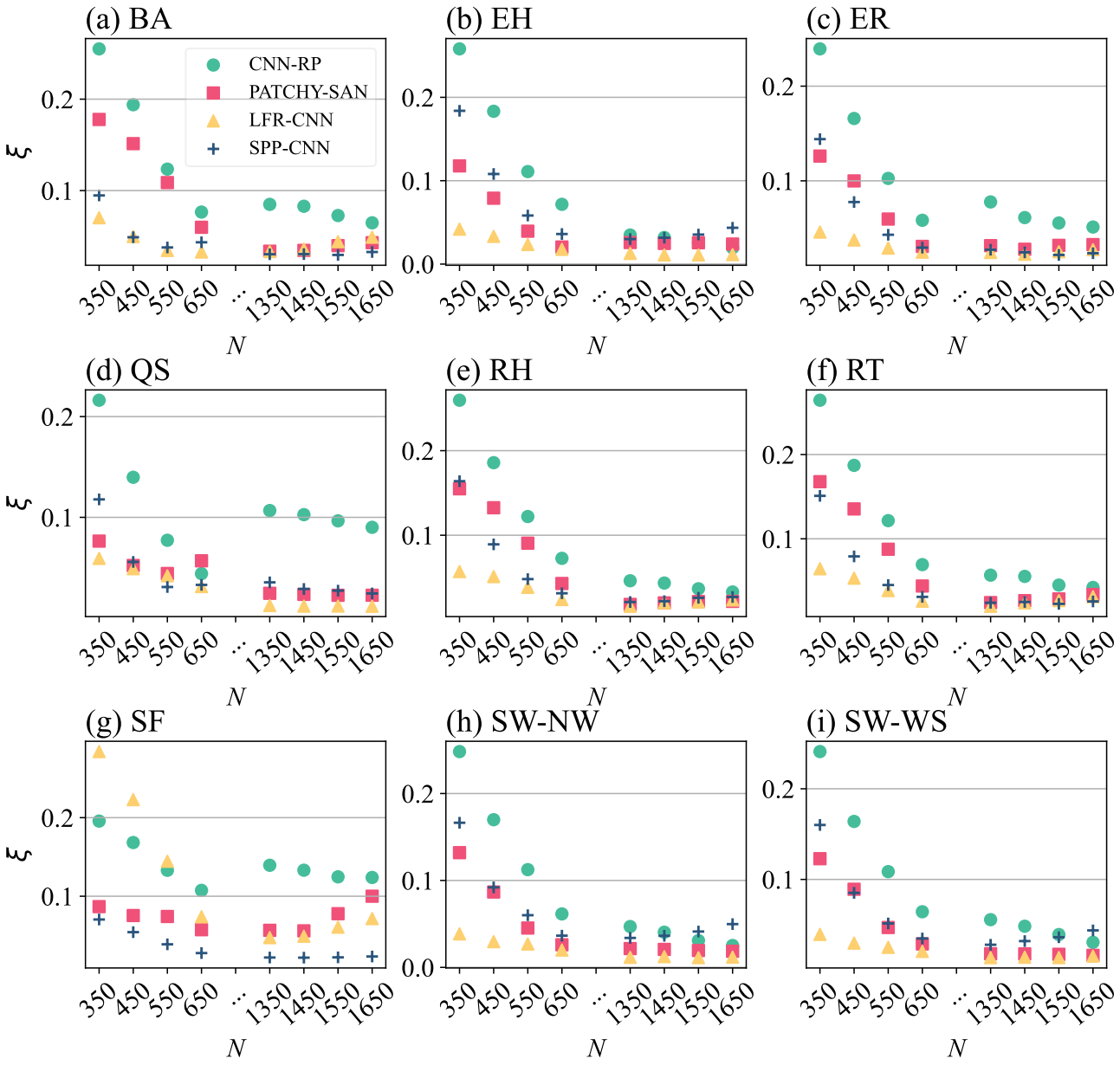


Fig. S6: Prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN for unseen network sizes (UNS). Controllability robustness of directed networks under random node attacks is predicted.

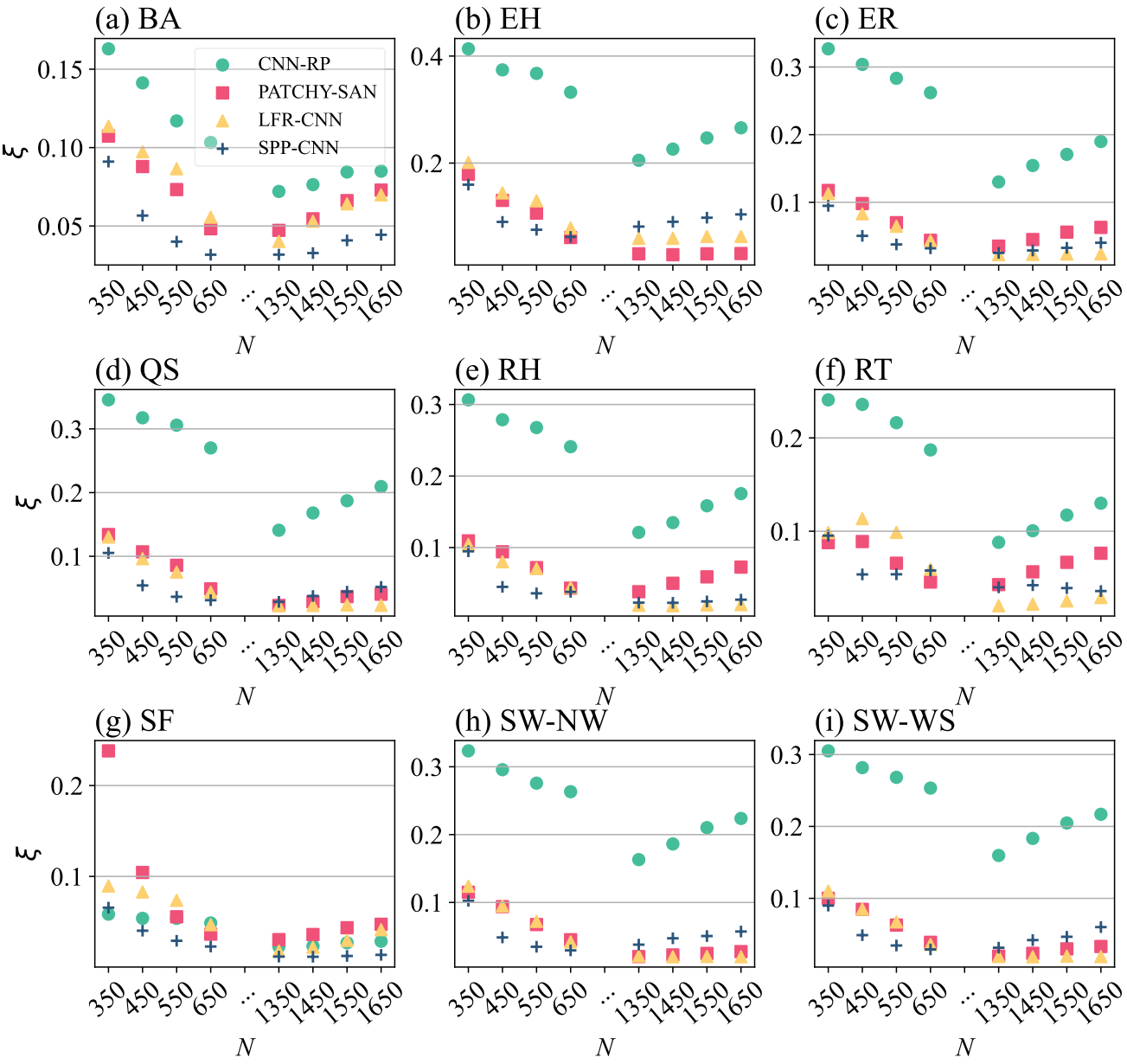


Fig. S7: Prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN for unseen network sizes (UNS). Connectivity robustness of undirected networks under maximum-degree node attacks is predicted.

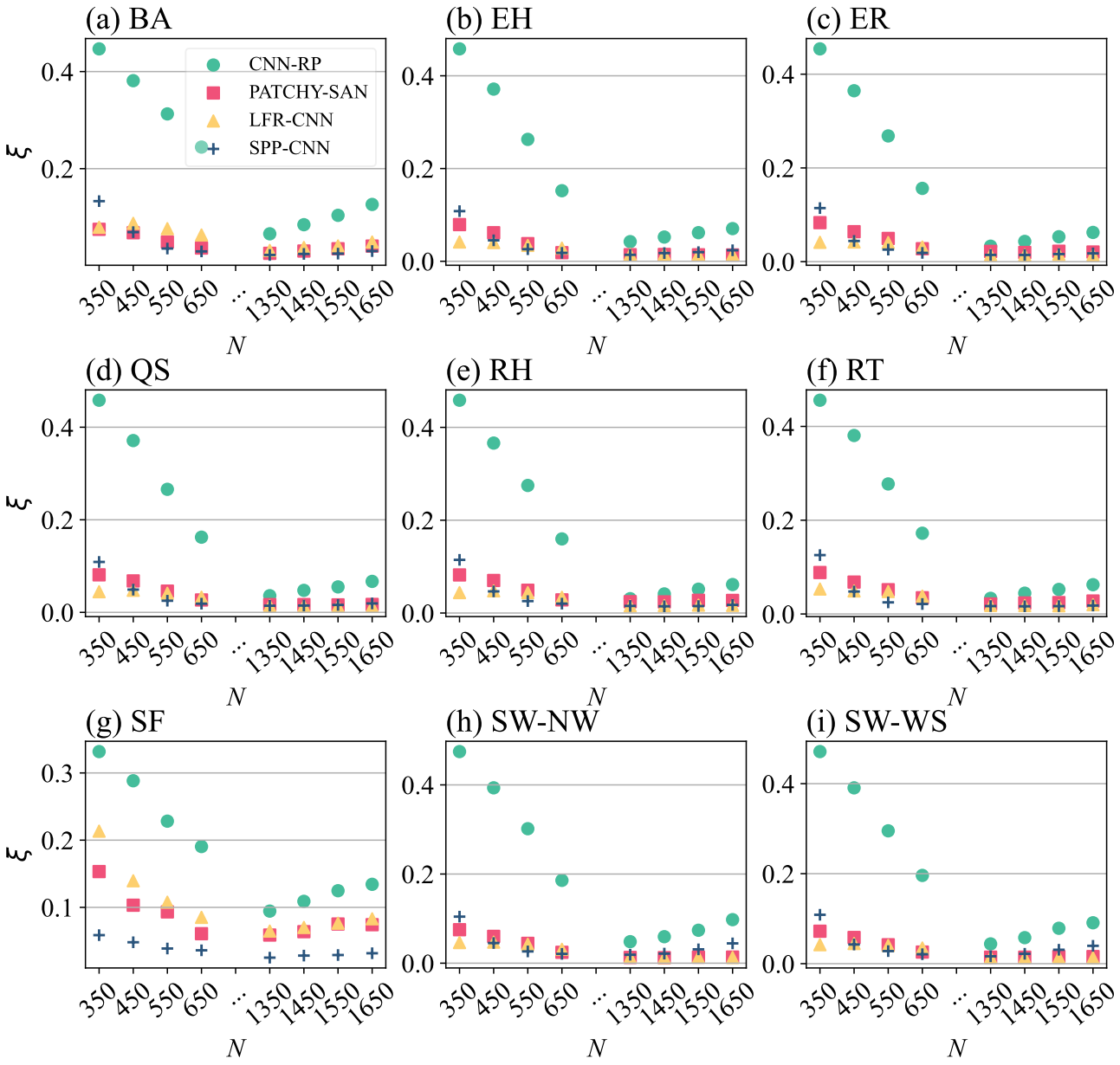


Fig. S8: Prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN for unseen network sizes (UNS). Controllability robustness of undirected networks under random node attacks is predicted.

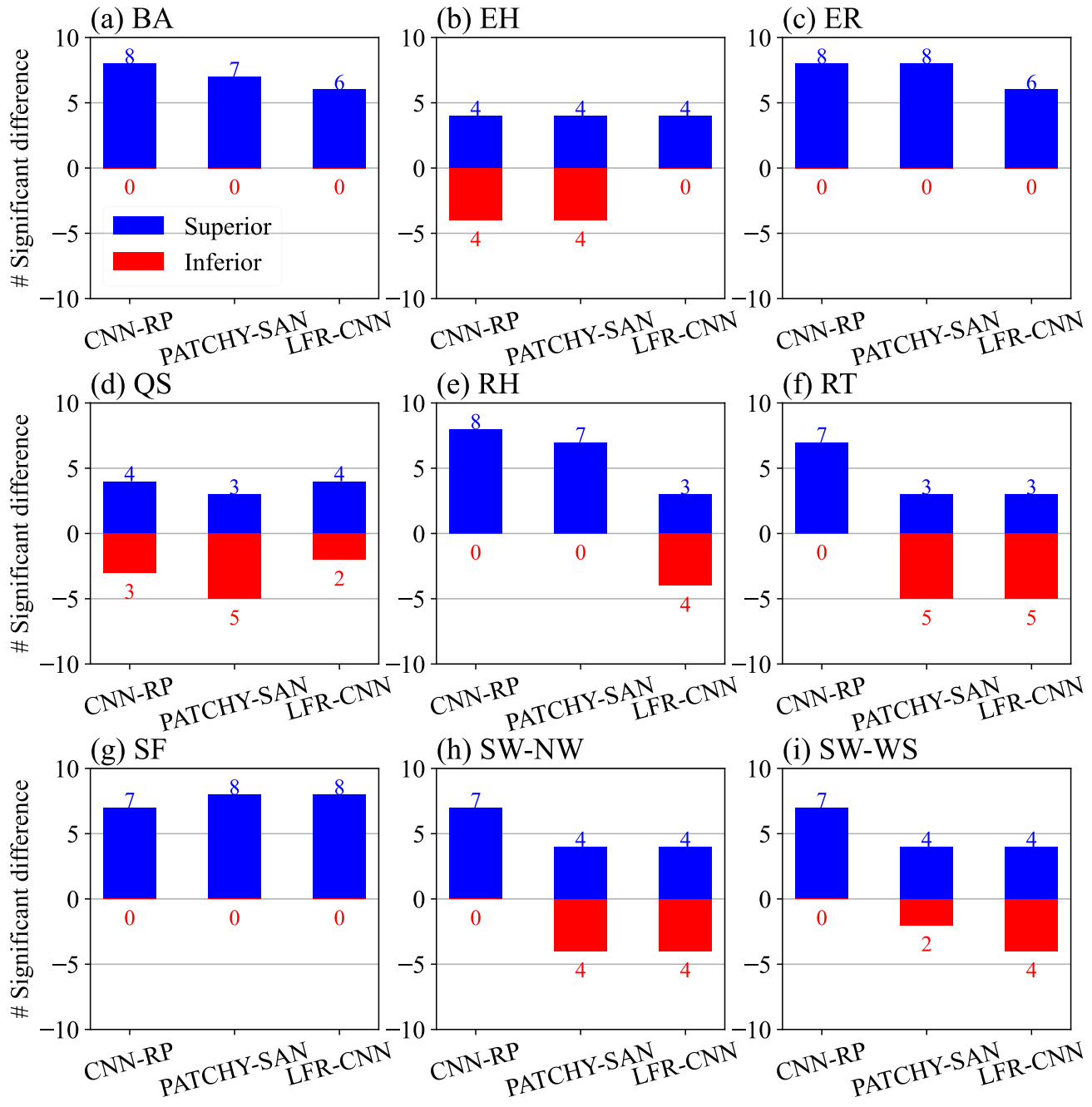


Fig. S9: Numbers of superiors and inferiors obtained by SPP-CNN, compared to each one of CNN-RP, PATCHY-SAN, and LFR-CNN. Connectivity robustness of directed networks under maximum-degree node attacks is predicted.

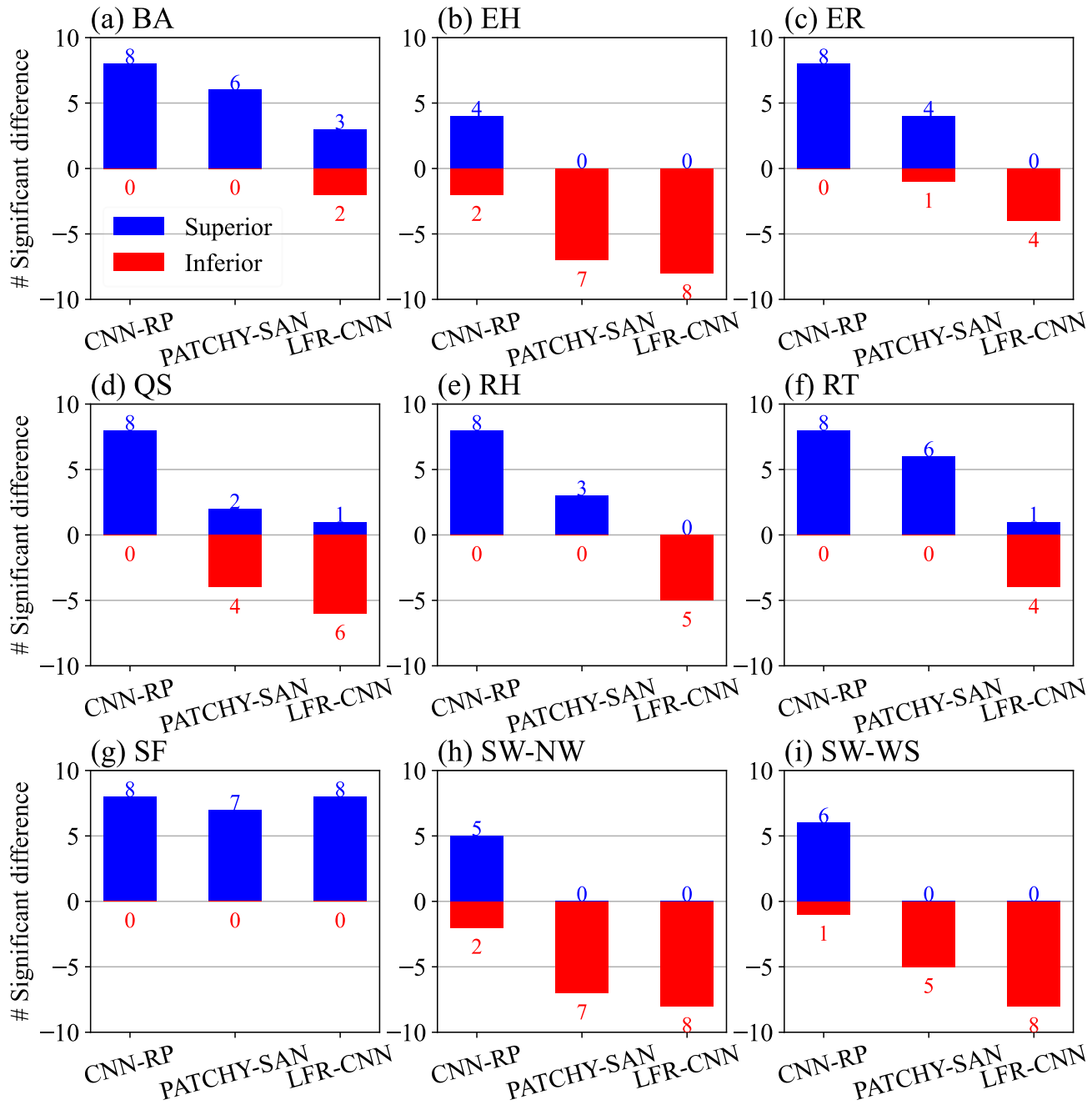


Fig. S10: Numbers of superiors and inferiors obtained by SPP-CNN, compared to each one of CNN-RP, PATCHY-SAN, and LFR-CNN. Controllability robustness of directed networks under random node attacks is predicted.

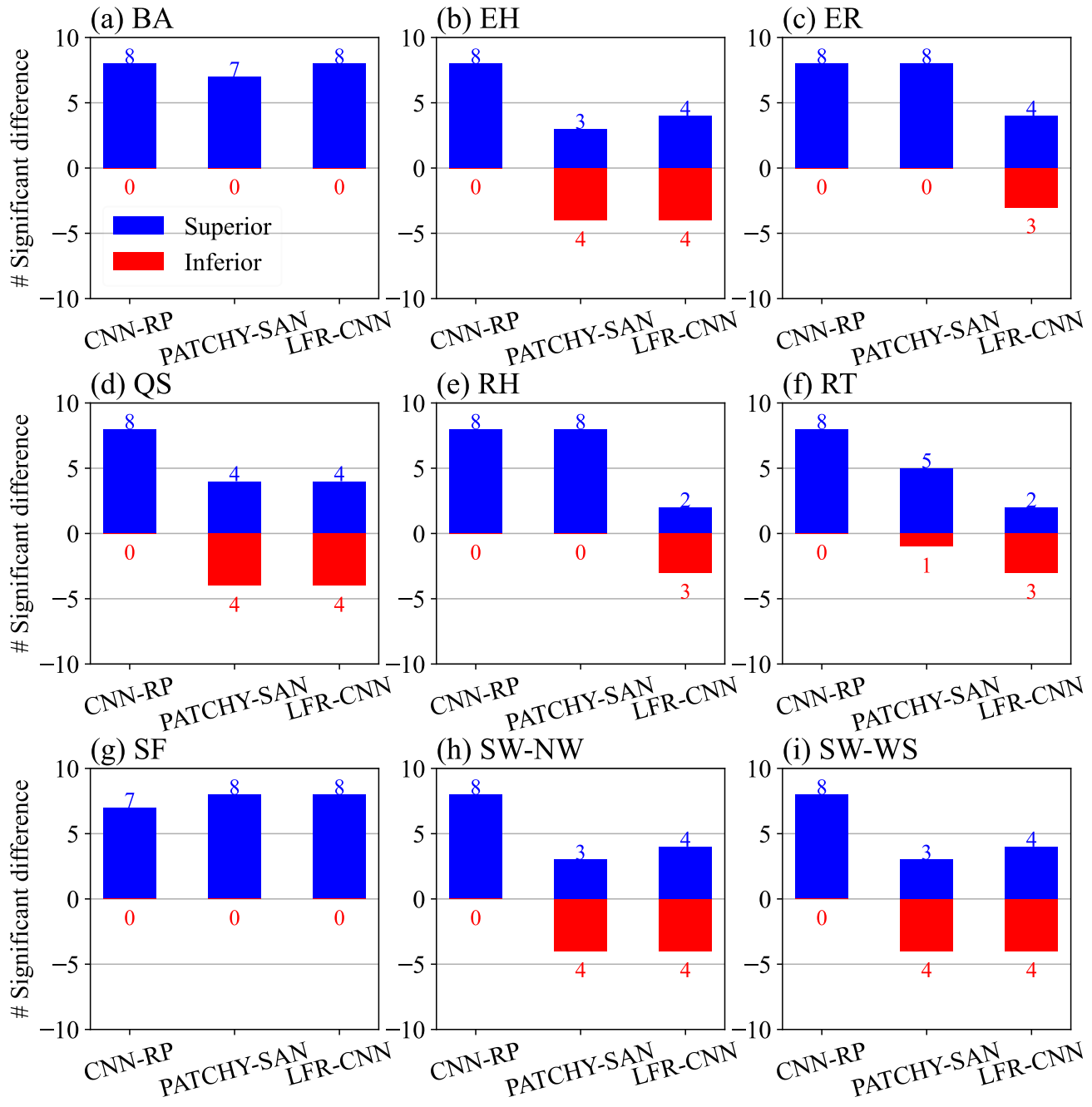


Fig. S11: Numbers of superiors and inferiors obtained by SPP-CNN, compared to each one of CNN-RP, PATCHY-SAN, and LFR-CNN. Connectivity robustness of undirected networks under maximum-degree node attacks is predicted.

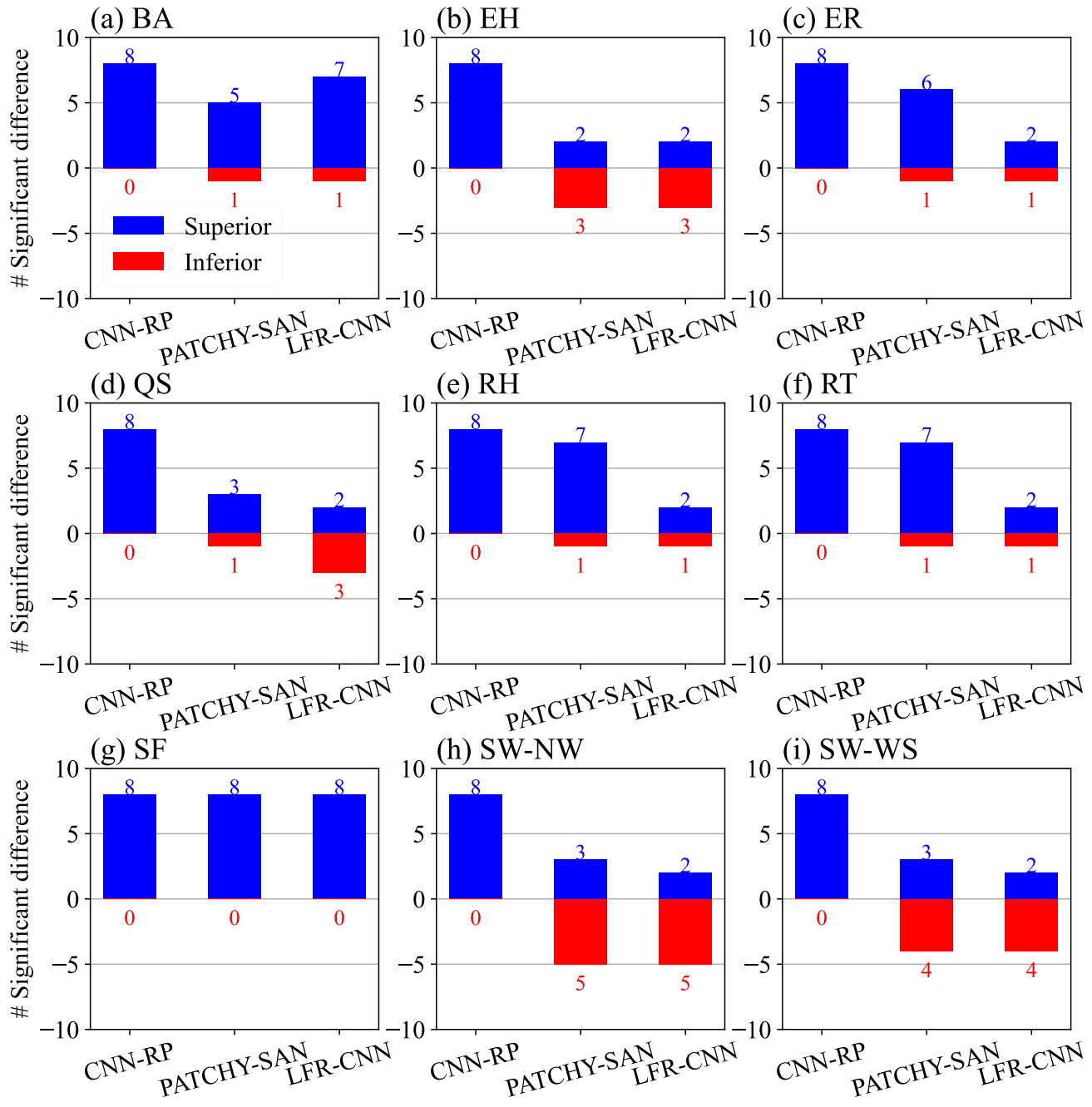
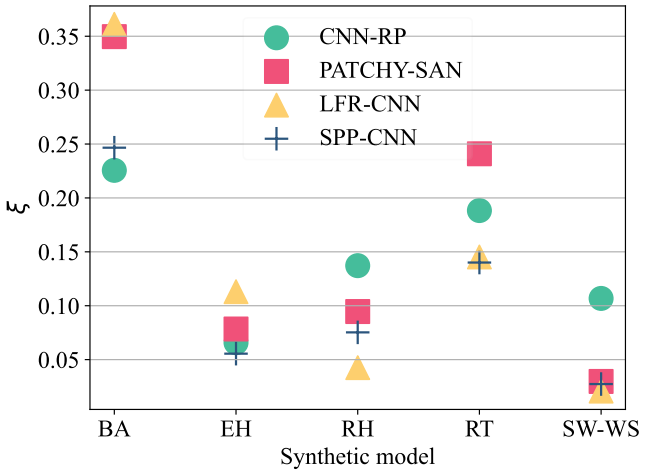
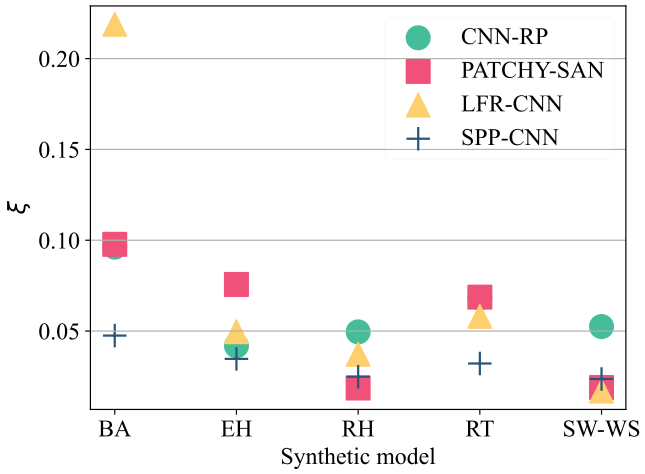


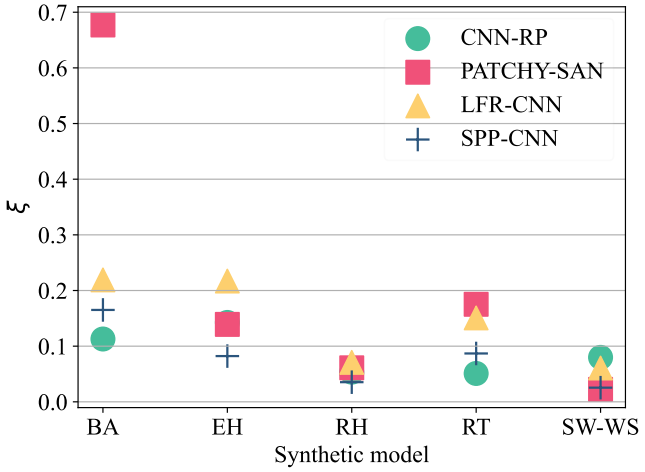
Fig. S12: Numbers of superiors and inferiors obtained by SPP-CNN, compared to each one of CNN-RP, PATCHY-SAN, and LFR-CNN. Controllability robustness of undirected networks under random node attacks is predicted.



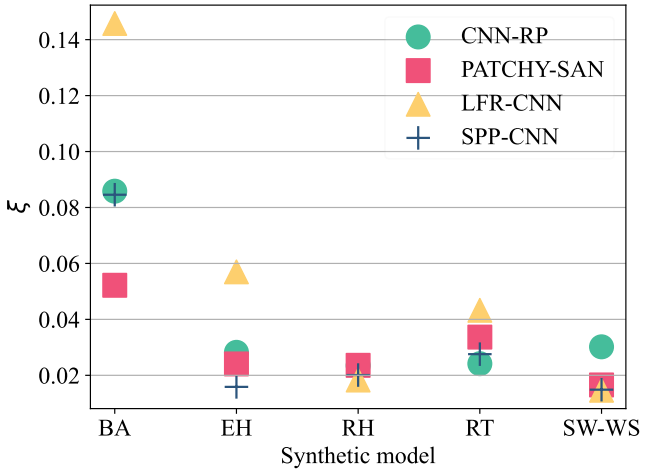
(a) Connectivity robustness of directed networks under maximum-degree node attacks.



(b) Connectivity robustness of directed networks under random node attacks.

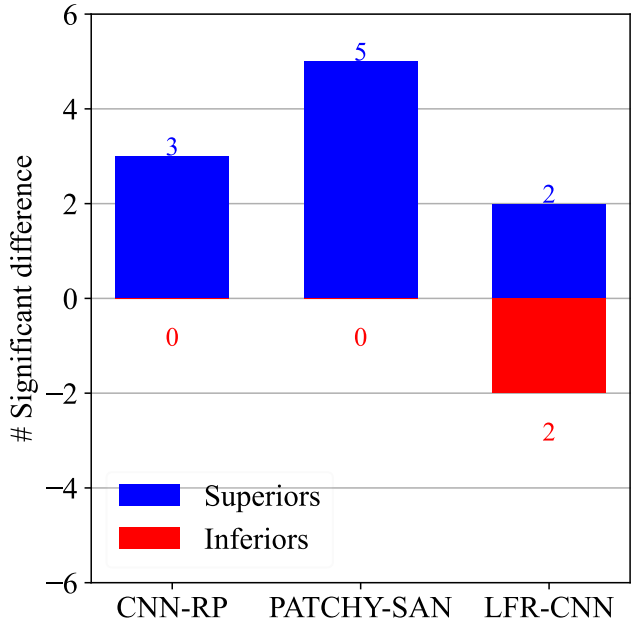


(c) Connectivity robustness of undirected networks under maximum-degree node attacks.

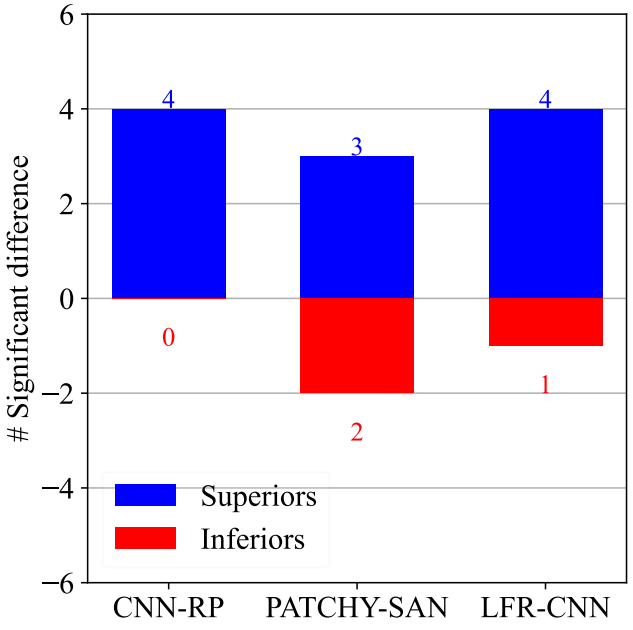


(d) Controllability robustness of undirected networks under random node attacks.

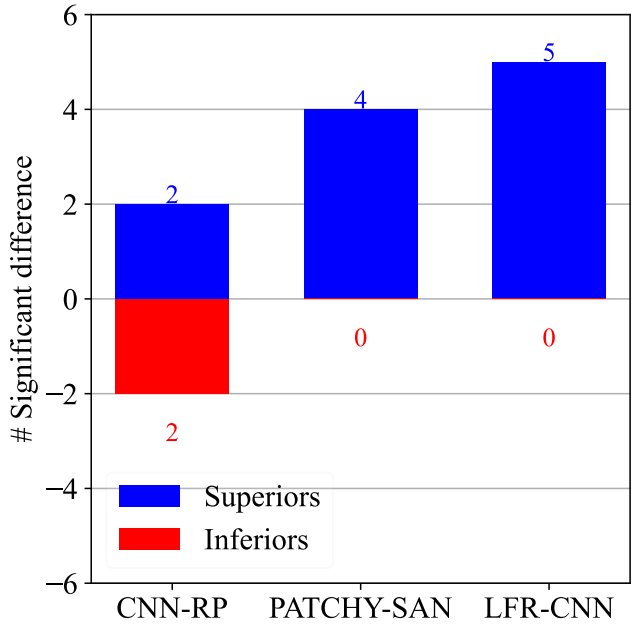
Fig. S13: Prediction errors obtained by SPP-CNN, CNN-RP, PATCHY-SAN, and LFR-CNN for unseen network topology (UNT).



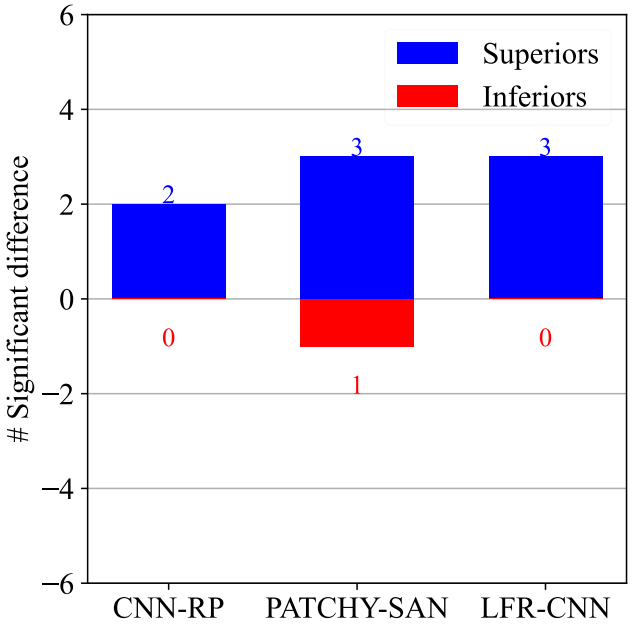
(a) Connectivity robustness of directed networks under maximum-degree node attacks.



(b) Controllability robustness of directed networks under random node attacks.



(c) Connectivity robustness of undirected networks under maximum-degree node attacks.



(d) Controllability robustness of undirected networks under random node attacks.

Fig. S14: Numbers of superiors and inferiors obtained by SPP-CNN, compared to each one of CNN-RP, PATCHY-SAN, and LFR-CNN for unseen network topology (UNT).