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**n-tangle: A network comparison method** LAZAROS K. GALLOS, NINA H. FEFFERMAN, Rutgers Univ — The ability to compare systems has always been a strong driving force in science. Network analysis has allowed researchers across fields to quantify and characterize numerous patterns of interactions among individuals. The comparison of different networks, though, still remains a puzzling problem. Here, we introduce the n-tangle method to directly compare two networks for structural similarity, based on the distribution of edge density in network sub-graphs. The crux of this method is to capture how many affiliations we expect to find when we isolate any given size of connected sub-group. We demonstrate that this method can efficiently introduce comparative analysis into network science and opens the road for many new applications. Our approach avoids inherent constraints of other methods and can be applied to networks of different size and structure. Our method can be expanded to study a multitude of additional properties, such as network classification, changes during time evolution, convergence of growth models, and detection of structural changes during damage.

Lazaros Gallos  
Rutgers Univ

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