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Small-World Propensity: A novel statistic to quantify weighted networks DANIELLE BASSETT, SARAH MULDOON, Univ of Pennsylvania, ERIC BRIDGEFORD, John Hopkins University — Many real-world networks have been shown to display a small-world structure with high local clustering yet short average path length between any two nodes. However, characterization of small-world properties has generally relied on a binarized representation of such graphs, neglecting the important fact that, in reality, many real-world networks are actually composed of weighted connections spanning a wide range of strengths. Here, we present a generalization of the Watts-Strogtaz formalism for weighted networks along with a novel statistic called the Small-World Propensity that quantifies both binary and weighted small-world structure. We apply this measure to real-world brain networks and show that by retaining network weights, we are able to better understand the small-world structure of these systems.

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