

Abstract Submitted
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Metric Structure of Bipartite Networks MAKSIM KITSAK, UCSD, FRAGKISKOS PAPADOPOULOS, Cyprus University of Technology,, DMITRI KRIOUKOV, UCSD — Many social, biological and technological systems can be conveniently represented as bipartite networks, consisting of two disjoint sets of elements along with edges connecting only elements from different sets. Many of such systems are characterized by high values of bipartite clustering coefficient. We also find that pairs of elements in these bipartite systems tend to have many common neighbors. We present a natural interpretation of these observations. We suggest that elements of the above bipartite systems exist in underlying metric spaces, such that the observed high clustering is a topological reflection of the triangle inequality, the key property of metric space. We propose a simple stochastic mechanism of formation of bipartite networks embedded in metric spaces. We prove that this mechanism is able to reproduce the observed topological properties of bipartite networks. We also discuss the possibility of constructive embedding of real bipartite systems into metric spaces. In my talk I will overview the concept of hidden metric spaces with respect to both unipartite and bipartite networks. I will also discuss existing methods used to infer hidden metric spaces in real networks and possible applications for bipartite networks.

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