1163-62-899 **David M Ruth*** (druth@usna.edu), druth@usna.edu. *Graph-theoretic approaches to change detection, with defense applications.*

Detecting a distribution change with respect to sets or sequences of observations is a classic problem in statistics. The problem is especially challenging in multivariate settings where underlying probability distributions are unknown; this is the case in myriad defense applications. Graph-theoretic methods have proven useful in detecting subtle distribution changes in such instances. Data are modeled as complete graphs, where each observation constitutes a vertex and each vertex pair has an undirected edge weighted by interpoint dissimilarity. Successful approaches have used minimum spanning trees, nearest neighbor graphs, minimum-weight non-bipartite matchings, and other minimum-weight regular graphs. We review key concepts associated with these approaches, share some recent work that counts edges ordered by weight in a manner that is computationally inexpensive and also has impressive power to detect distribution changes in a two-sample setting, then extend this recent work to the sequential change-detection setting. Defense applications will be considered. (Received September 15, 2020)