1145-62-2306 **David M. Ruth*** (druth@usna.edu) and **Michael J. Wallace**. *A Nonparametric Multivariate Two-Sample Test Using Cumulative Counts of Ranked Edges.* Preliminary report.

The multivariate two-sample problem is one of ongoing interest in statistics. In the setting of graph-theoretic statistical approaches, the first consequential multivariate two-sample test was introduced decades ago by Freidman and Rafsky using minimum spanning trees. More recently, new approaches have been explored using other optimal subgraphs to detect group differences. Data observations are modeled as graph vertices and undirected edges are weighted by interpoint dissimilarity. The rationale of these tests is that, if two samples are from different distributions, observations would be preferentially closer to others from the same sample than those from the other sample, and that this preference might be detected with some appropriate edge-counting method. This presentation will describe methodology and results associated with a newly-developed test based on cumulative counts of ranked edges. The new test has several desirable properties: it is nonparametric, it is sensitive to differences in both location and scale, it retains test power in the presence of imbalanced sample sizes, and its computational cost is low relative to other graph-theoretic tests. Test performance will be demonstrated for both simulated and real-world data examples. (Received September 25, 2018)