

Statistics Seminar  
Department of Mathematics and Statistics

<b>DATE:</b>	Thursday, March 9, 2022
<b>TIME:</b>	1:15pm - 2:15pm
<b>LOCATION:</b>	WH 100E
<b>SPEAKER:</b>	Baozhen Wang, Binghamton University
<b>TITLE:</b>	Combining p-values via averaging

**Abstract**

This paper is published in *Biometrika* by V. Vovk and R. Wang. They propose general methods for the problem of multiple testing of a single hypothesis, with a standard goal of combining a number of p-values without making any assumptions about their dependence structure. A result by Rüschendorf (1982) and, independently, Meng (1993) implies that the p-values can be combined by scaling up their arithmetic mean by a factor of 2, and no smaller factor is sufficient in general. A similar result by Mattner about the geometric mean replaces 2 by  $e$ . Based on more recent developments in mathematical finance, specifically, robust risk aggregation techniques, they extend these results to generalized means; in particular, they show that  $K$  p-values can be combined by scaling up their harmonic mean by a factor of  $\log K$  asymptotically as  $K$  tends to infinity. This leads to a generalized version of the Bonferroni-Holm procedure. They also explore methods using weighted averages of p-values.

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