

Seminar: 09/25/2023

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Title: The Greenwood statistic, stochastic dominance, clustering and heavy tails

Abstract: The Greenwood statistic T_n and its functions, including sample coefficient of variation, often arise in testing exponentiality or detecting clustering or heterogeneity. We provide a general result describing stochastic behavior of T_n in response to stochastic behavior of the sample data. Our result provides a rigorous base for constructing tests and assuring that confidence regions are actually intervals for the tail parameter of many power-tail distributions. We also present a result explaining the connection between clustering and heaviness of tail for several classes of distributions and its extension to general heavy tailed families. Our results provide theoretical justification for T_n being an effective and commonly used statistic discriminating between regularity/uniformity and clustering in presence of heavy tails in applied sciences. We also note that the use of Greenwood statistic as a measure of heterogeneity or clustering is limited to data with large outliers, as opposed to those close to zero. This is joint work with M. Arendarczyk and A. Panorska.