

Joint monitoring of mean and dispersion of count data / Runhui Wang, Jian Li, Lian Xue

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Abstrak

ABSTRACT

Count data are often described by the Poisson distribution, which requires identical mean and variance, namely equi dispersion. However, in practical situations, count data usually exhibit either over dispersion with variance larger than mean, or under dispersion with variance smaller than mean. Therefore, traditional approaches that focus on only mean shifts, such as the c chart, cannot monitor count data with over/under dispersion efficiently. To monitor mean and dispersion of count data simultaneously, this paper adopts Conway Maxwell Poisson (COMPOisson) distributions to fit count data with over/under dispersion, and constructs a control chart based on the likelihood ratio test. The proposed chart is powerful in detecting both mean and dispersion shifts of count data with either over dispersion or under dispersion. Numerical simulations have demonstrated its performance in various cases.