A class of multi-sample nonparametric tests for panel count data

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Abstract   This paper considers the problem of multi-sample nonparametric comparison of mean functions of point processes with panel count data, which arise naturally when recurrent events are considered. Such data frequently occur in medical follow-up studies and reliability experiments, for example. For the problem considered, we construct a class of nonparametric test statistics based on the integrated weighted differences between the estimated mean functions of the point processes. The asymptotic distributions of the proposed statistics are rigorously derived when the monotonicity assumptions for weight processes are removed, and their finite-sample properties are examined through Monte Carlo simulations. The simulation results show that the proposed methods are good for practical use and are slightly powerful than the existing tests. A set of panel count data from a cancer study is analyzed and presented as an illustrative example.