Testing of Two Sample Proportional Intensity Assumption for Non-Homogeneous Poisson Processes

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Abstract

For two independent non-homogeneous Poisson processes with unknown intensities we propose a test for testing the hypothesis that the ratio of the intensities is constant versus it is increasing on $(0, t]$. The existing test procedures for testing such relative trends are based on conditioning on the numbers of failures observed in $(0, t]$ from the two processes. Our test is unconditional and is based on the original time truncated data which enables us to have meaningful asymptotics. We obtain the asymptotic null distribution (as t becomes large) of the proposed test statistic and show that the proposed test is consistent against several large classes of alternatives. It was observed by Park and Kim (1992) that it is difficult to distinguish between the Power-Law and Log-Linear processes for certain parameter values. We show that our test is consistent for such alternatives also.