

STATISTICAL TESTS FOR SIGNALS IN  
CATEGORICAL TEMPORAL DATA

by

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Abstract

This paper describes methods for using categorical temporal data to detect differences in behavior between a treated group and a control group. The first-level output from the data is typically a set of many different correlated test statistics comparing the two groups. In previous work, a decision was made by counting the number of significant individual tests and calibrating with bootstrap simulation. This article goes further, suggesting two possible alternative statistics: the sum of the squared individual test statistics and a Wald-like combination of the individual test statistics. All three overall comparison statistics are defined and a method for computing critical values from simulated distributions using a bootstrap method is given. The use of all three methods is then demonstrated on each of three data sets. Finally, a simulated power study reveals that the Wald-like statistic is much better than the other two, leading to the suggestion of its use in place of the other two statistics.