Department of Decision Sciences

Statistics Seminar

Testing of Exponentiality with Application to Historic Data

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12:30pm Room 3-E4-SR03 Via Rontgen 1 Milano

Abstract

Testing of exponentiality is very important in Probability and Statistics, especially in reliability theory, queueing theory and survival analysis. First tests of exponentiality appeared in 1946 - 1950 and pertained to Greenwood, Moran and Sherman. Later appeared hundreds of papers and numerous surveys on the subject, even several handbooks on exponential distribution. We classify the numerous exponentiality tests into several groups and calculate (or cite) their efficiency properties against standard alternatives.

Next we apply the exponentiality tests to confirm or disprove the exponential character of some historical data. It is well-known that the lifetime of human beings cannot be exponentially distributed as humans are aging; hence their lifetimes have an increasing failure rate. But some authors came to the surprising conclusion that the lengths of reign for many historical rulers, kings, governors, etc. are in agreement with exponential distribution. We discuss this observation for some dynasties beginning by kings of Judea and Israel (according to the Bible) and by Roman emperors. We also touch upon the scantily explored question concerning the duration of historical empires and some similar historical data.

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