Recurrent data analysis in the framework of socket models

Dr. Vasiliy V. Krivtsov
Director, Reliability Analytics
The Ford Motor Company

Abstract

Consider a set of "sibling" components in a multi-socket repairable system. In the case of an automobile, for example, these siblings would be spark plugs, light bulbs, tires, that is, identical components that are coded with the same part number. When field [big] data are analyzed, a dilemma arises as to how to interpret a recurrent replacement of a sibling component: as a secondary failure of the component that has already been replaced once, or as the first failure of the component's sibling(s)? From the stand point of root-cause analysis, the task is to understand whether recurrent failures are related to (i) a particular sibling, which might be operating in inauspicious conditions relative to other siblings, or (ii) to all siblings on the vehicle. One could attribute Scenario (i) to a system-level (e.g. system interaction) problem, and Scenario (ii) to a component-level (supplier quality) problem. We first review a statistical procedure that solves the above-mentioned dilemma in the framework of ordinary renewal process (ORP) and then extend the discussion to the non-homogeneous Poisson process (NHPP) and the g-renewal process (GRP).

Bio

Vasiliy Krivtsov is the Director of Reliability Analytics at the Ford Motor Company. He also holds the position of Adjunct Associate Professor of Reliability Engineering at the University of Maryland, where he teaches a graduate course on Advanced Reliability Data Analysis. Krivtsov has earned a PhD degree in Electrical Engineering from Kharkov Polytechnic Institute, Ukraine and a PhD in Reliability Engineering from the University of Maryland, USA. He is the author and co-author of over 60 professional publications, including 2 books on Reliability Engineering and Risk Analysis, 9 patented inventions and 6 trade secret inventions on statistical algorithms for Ford. He is a Vice Chair of the International Reliability Symposium (RAMS®) Tutorials Committee and a Senior Member of IEEE. Prior to Ford, Krivtsov held the position of Associate Professor of Electrical Engineering in Ukraine, and that of Graduate Research Scientist at the University of Maryland Center for Reliability Engineering. Further information on Dr. Krivtsov's professional activity is available at www.krivtsov.net

Friday, October 12
11:00 - 12:00 PM

Chrysler Center
Room 151
2121 Bonisteel Blvd
Ann Arbor, MI 48109

Map to Chrysler Center

Metered parking is available on campus.

M COLLEGE OF ENGINEERING
INTEGRATIVE SYSTEMS + DESIGN
UNIVERSITY OF MICHIGAN

isd.engin.umich.edu