

MARTINGALE APPROACH TO EWMA CONTROL CHARTS FOR CHANGES IN EXPONENTIAL DISTRIBUTION

YUPAPORN AREEPONG & ALEXANDER NOVIKOV

ABSTRACT

Exponentially weighted moving average (EWMA) procedure is a popular chart used for detecting small shifts of parameters of distributions in quality control and surveillance problems. The objective of this paper is to derive characteristics of a particular process such as Average Run Length (ARL) and Average Delay time (AD) under EWMA procedure assuming that observations follow an exponential distribution. Using the martingale approach we find explicit expressions for characteristics of EWMA as Average Run Length (ARL) and Average Delay time (AD). We compare the performance of the proposed expressions under EWMA and other procedures such as CUSUM based ARL and AD using some simulation studies.

Keywords: Martingale approach; stopping time; EWMA; averaged run length; average delay

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Yupaporn Areepong & Alexander Novikov

*Department of Mathematical Sciences
Faculty of Science
University of Technology, Sydney
P.O. Box. 123
Broadway, NSW 2008
AUSTRALIA
E-mail: areepong@hotmail.com^{*}, Alex.Novikov@uts.edu.au*

^{*} Corresponding author