



ΚΥΚΛΟΣ ΣΕΜΙΝΑΡΙΩΝ ΣΤΑΤΙΣΤΙΚΗΣ ΦΕΒΡΟΥΑΡΙΟΣ 2020

Philippe Castagliola

University of Nantes (France)

Monitoring Compositional Data using Multivariate EWMA

ΠΕΜΠΤΗ 6/2/2020, 13:15

ΑΙΘΟΥΣΑ Τ103, ΤΡΟΙΑΣ 2, ΝΕΟ ΚΤΙΡΙΟ ΟΠΑ

ΠΕΡΙΛΗΨΗ

Recently, the monitoring of compositional data (CoDa) by means of control charts has been investigated in the Statistical Process Control literature. In this presentation, we introduce the concept of CoDa (how to model and transform such data) and we develop a Phase II Multivariate Exponentially Weighted Moving Average (MEWMA) control chart, for the continuous surveillance of compositional data based on a transformation into coordinate representation. We use a Markov chain approximation to determine the performance of the proposed multivariate control chart. The optimal MEWMA smoothing constants, control limits and out-of-control Average Run Lengths have been computed for different combinations of the in-control Average Run Lengths and the number of variables. Several tables are presented and enumerated to show the statistical performance of the proposed control chart. An example illustrates the use of this chart on an industrial problem.



**AUEB STATISTICS SEMINAR SERIES
FEBRUARY 2020**

Philippe Castagliola
University of Nantes (France)

Monitoring Compositional Data using Multivariate EWMA

THURSDAY 6/2/2020, 13:15

Room T103, 2 TROIAS STR., NEW AUEB BUILDING

ABSTRACT

Recently, the monitoring of compositional data (CoDa) by means of control charts has been investigated in the Statistical Process Control literature. In this presentation, we introduce the concept of CoDa (how to model and transform such data) and we develop a Phase II Multivariate Exponentially Weighted Moving Average (MEWMA) control chart, for the continuous surveillance of compositional data based on a transformation into coordinate representation. We use a Markov chain approximation to determine the performance of the proposed multivariate control chart. The optimal MEWMA smoothing constants, control limits and out-of-control Average Run Lengths have been computed for different combinations of the in-control Average Run Lengths and the number of variables. Several tables are presented and enumerated to show the statistical performance of the proposed control chart. An example illustrates the use of this chart on an industrial problem.