DRAFT INDIAN STANDARD IN WIDE CIRCULATION

Reference : MSD 03/T-136   **Date : 09 July 2024**

TECHNICAL COMMITTEE : Statistical Methods for Quality , Data Analytics and Reliability, MSD 03

To,

All concerned

Dear Madam/Sir,

The following document has been prepared by the Statistical Methods for Quality , Data Analytics and Reliability Sectional Committee, MSD 03. Please click here to view the document.

Document Number : MSD 03 (26013) WC
Title of the document : Determination and use of polynomial calibration functions
Document Type : New Indian Standard

This document has following salient features which may require specific attention for your valuable comments:

1) 1.1 This document is concerned with polynomial calibration functions that describe the relationship between a stimulus variable and a response variable. These functions contain parameters estimated from calibration data consisting of a set of pairs of stimulus value and response value. Various cases are considered relating to the nature of any uncertainties associated with the data.

2) 1.2 Estimates of the polynomial function parameters are determined using least-squares methods, taking account of the specified uncertainty information. It is assumed that the calibration data are fit for purpose and thus the treatment of outliers is not considered. It is also assumed that the calibration data errors are regarded as drawn from normal distributions. An emphasis of this document is on choosing the least-squares method appropriate for the nature of the data uncertainties in any particular case. Since these methods are well documented in the technical literature and software that implements them is freely available, they are not described in this document.

3) 1.3 Commonly occurring types of covariance matrix associated with the calibration data are considered covering (a) response data uncertainties, (b) response data uncertainties and covariances, (c) stimulus and response data uncertainties, and (d) stimulus data uncertainties and covariances, and response data uncertainties and covariances. The case where the data uncertainties are unknown is also treated.

4) 1.4 Methods for selecting the degree of the polynomial calibration function according to prescribed criteria are given. The covariance matrix associated with the estimates of the parameters in the selected polynomial function is available as a by-product of the least-squares methods used.

5) 1.5 For the chosen polynomial function this document describes the use of the parameter estimates and their associated covariance matrix for inverse and direct evaluation. It also describes how the provisions of ISO/IEC Guide 98-3:2008 (GUM) can be used to provide the associated standard uncertainties.

6) 1.6 Consideration is given to accounting for certain constraints (such as the polynomial passing through the origin)

that may need to be imposed and also to the use of transformations of the variables that may render the behaviour of the calibration function more polynomial-like. Interchanging the roles of the variables is also considered.

7) Examples from several areas of measurement science illustrate the use of this document.

Please examine the document and share your comments regarding further improvement in the document.

Last date for sharing the comments is : 08 August 2024

The comments should be shared in the prescribed template through this portal only; and the comments so received shall be taken up by the Sectional Committee for necessary action. For any other query, please write an email at msd@bis.gov.in to the undersigned at Bureau of Indian Standard, Manak Bhawan, 9, Bahadur Shah Zafar Marg, New Delhi.

In case no comments are received, we would presume your approval of the documents. However, in case we receive any comments on the document, the same shall be put up to the Sectional Committee for necessary action.

Thanking You,

Yours faithfully,
(ANUJ SWARUP BHATNAGAR)
Head (Management and Systems Department)
Email: msd@bis.gov.in

व्यापक परिचालन में मसौदा(दे)

हमारा सन्दर्भ : MSD 03/T-136 दिनांक : 09-07-2024

तकनीकी समिति : Statistical Methods for Quality , Data Analytics and Reliability Sectional Committee, MSD 03

प्राप्तकर्ता : रूचि रखने वाले सभी निकाय

महोदय/या,

निम्नलिखित मसौदा तैयार किया गया है :

प्रलेख संख्या : MSD 03 (26013) WC
शीर्षक :

कृपया इस/इन मानक(को)/संसोधन(नो) के मसौदे(दो) का अवलोकन करें और अपनी सम्मतियाँ यह बताते हुए भेजें कि यदि ये मानक(को) के संशोधन(नो) के रूप में प्रकाशित हो तो इन पर अमल करने में आपके व्यवसाय अथवा कारोबार में क्या कठिनाइयां आ सकती हैं ।

सम्मतियाँ भेजने की अंतिम तिथि : 08 August 2024

सम्मतियाँ, यदि कोई हों तो, कृपया यहाँ क्लिक करके ऑनलाइन पोर्टल के माध्यम से ऊपर दी गयी अंतिम तिथि तक दर्ज कराएं ।

यह/ये प्रलेख भारतीय मानक ब्यूरो की वेबसाइट www.bis.gov.in पर भी उपलब्ध है/हैं ।

धन्यवाद ।

भवदीय/भवदिया,
विभाग प्रमुख का नाम : ANUJ SWARUP BHATNAGAR
(Management and Systems Department)
ई-मेल : msd@bis.gov.in