Corrections and Comments to *Bayesian Inference — Parameter Estimation and Decisions* published by Springer, Heidelberg 2003

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1 Knowledge and Logic

No comments.

2 Bayes' Theorem

One requires the existence of the integral in Eq. (2.5). If it does not exist, the posterior distribution (2.6) does not exist and the parameter ξ cannot be inferred.

3 Probable and Improbable Data

From Tab. 3.1, one sees that $1 - K$ becomes very small if $\Delta\xi$ is a few σ. Therefore K is often expressed as $\Delta\xi/\sigma$, i.e. the length of the corresponding error interval in units of σ.

4 Description of Distributions I: Real x

In footnote 1 on p. 29, the name Gauß should be written with the German sharp s.

5 Description of Distributions II: Natural x

No comments.

6 Form Invariance I: Real x

The matrix $\mathbf{m}$ used in Eq. (6.36) is a metrical tensor in the vector space in which the curve (6.32) is imbedded. One can also define a metric on the curve, more generally a metric on curved surfaces. This is a metric in the space of the parameter(s) ξ. The Fisher matrix defined in ch. 9 turns out to be the metrical tensor in the space of ξ. The fact that in the present book $\mathbf{m}$ always equals unity is due to a common property of all transformation groups of form invariant models: The transformations are all orthogonal in the sense of ch. 8. The hyperbolic transformation (6.6) is not orthogonal.

7 Examples of Invariant Measures

No comments.

8 A Linear Representation of Form Invariance

The text before Eq. (8.1) should read: "We consider the function $f(x)$ as a vector f with the components $f_x = f(x)$. In the sequel the components are written in both ways, f_x or $f(x)$."

Equation (8.15) should read

$$(\mathbf{G}_\xi f)_x = f(G_\xi^{-1}\,x)\left|\frac{\partial G_\xi^{-1}\,x}{\partial x}\right|^{1/2}.$$

9 Beyond Form Invariance: The Geometric Prior

Equation (9.17) shows that the Fisher matrix is the metrical tensor on the surface $a(\xi)$. Thus the manifold of the probability amplitudes becomes a Riemannian space. See e.g. *Encyclopedia Britannica* 15th edition, Vol. 1, p.791, article on *Analysis, Vector and Tensor.*

10 Inferring the Mean or Standard Deviation

In the 4th line following Eq. (10.35), the first "in" is superfluous.

11 Form Invariance II: Natural x

In the second exponential on the r.h.s. of Eq. (11.22), there should be a bracket (before ξ.

12 Independence of Parameters

No comments.

13 The Art of Fitting I: Real x

In Eq. (13.4), the range of the indices should read

$$\nu, \nu' = 1, \ldots, n. \tag{1}$$

In Eq. (13.5), the summation over k is erroneous and should be omitted.

The symbol β is used in Eq. (13.1) to denote a function of t and ξ. In Eq. (13.7), the same symbol β is used to denote the vector composed of all β_k. It should read $\vec{\beta}$ when the vector is meant.

In Eq. (13.25), a minus-sign is missing in front of the lower left element of the matrix.

14 Judging a Fit I: Real x

In section 14.2, a piece of text has been printed twice. The text following equation (14.10) "We simplify this ..." should be omitted until and including equation (14.12).

15 The Art of Fitting II: Natural x

Section 15.7 must be reformulated in the future. — Certainly, the condition (15.55) ensures the orthogonality of the vectors $c(1)$ and $c(2)$. In this limit, the result on the parameter ξ_1' characterizing the intensity of the peak becomes independent of the result on the level of the background. Although this situation is desirable, one can extract ξ_1' even if it is not given. After appropriate integration over ξ_2' the error of ξ_1' will take care of the interrelation between peak and background.

In order to treat incoherent alternatives satisfactorily, one should express them as a density matrix. This posibility has not been explored in the present book.

16 Judging a Fit II: Natural x

No comments.

17 Summary

No comments.