Errata

This file contains comments and corrections for the book 'Differential Geometry and Statistics' by M.K. Murray and J.W. Rice.

Many of the mistakes corrected here were discovered by Preben Blæsild and a class that he taught. My thanks. I will adopt Preben's convention and use the notation a^n for the line on page a n lines from the top and a_n for the line on page a n lines from the bottom.

This file was last updated on the 10th of March 1995.

Michael Murray.

Preface

$xiii^{14}$: Neilsen should be spelt Nielsen.

Chapter 1

1_{17}: $\mu > 0$ should be $\sigma > 0$. This was corrected in the first reprinting.

2^{14}: that should be than

12_6: $a < 0$ should be $a > 0$

19^6: Better to write this as

$$f = \pi_p(f) + (f - \pi_p(f))$$

as the splitting is

$$R_\Omega = N_p \oplus T_p\tilde{P}.$$

21^{14}: The comment at the bottom of the page about different co-ordinates would be better here.

21_9: $\partial^2\theta^k$ should be $\partial^2\theta^l$

22_14:

$$\frac{\partial \ell}{\partial \chi^a \chi^b}$$

should be

$$\partial\ell\partial\chi^a\partial\ell\partial\chi^b.$$

Chapter 2

58_7: repeated must

Chapter 3

64_{16}: as should be a

70^{10}: $T\Phi$ should be $T\phi$

71^{15}: $n(n-1)/2)$ should be $n(n+1)/2$

73_3: The definition of a proper map is that the pre-image of a compact set is compact. Recall that compact subsets of $\mathbf{R}^n$ are those sets which are closed and bounded. If we take a small closed ball around the point in the middle of figure 3.3 its pre-image in $\mathbf{R}$ contains a half infinite interval so is clearly not closed and bounded so not compact. So this map $\mathbf{R} \to \mathbf{R}^2$ is not proper.

76_17: We are assuming that P is r dimensional.

80^{6--7}: The statement about π_p is wrong it is the orthogonal projection from R_Ω onto N_p. The subsequent formula from Chpater 1 is correct.

80^{11}: A vector X can be thought of as an operator on functions via the formula

$$X(f) = df(X).$$

This defines $X(Y(\ell)$ in the formula. This notation sits comfortably with the notation for the co-ordinate vector fields as

$$\frac{\partial}{\partial\theta^i}(f) = \frac{\partial f}{\partial\theta^i}.$$

81_6: P should be $\tilde{P}$

82^{14}: $=(f$ should be $=f($

86_{16}: In the matrix the term $1/\sigma$ should be 1

93_3: $x)$ should be $x))$

94^2: This not very well-written. We should have said that we define $f(g,x)$ by $gd\mu = \exp(f(g,x))d\mu$. Then considering $h(gd\mu) = (hg)d\mu$ we have on the one hand

$$\begin{aligned}(h(gd\mu)) &= h(\exp(f(g,x))d\mu)\\ &= \exp(hf(g,x))hd\mu\\ &= \exp(hf(g,x) + f(h,x))d\mu\end{aligned}$$

where

$$hf(g,x) = f(g,h^{-1}x).$$

On the other hand we have that

$$(hg)d\mu = \exp(hg,x)d\mu.$$

The identity then follows.

96^8: The definition of f^N should be

$$f^N(x^1,\ldots,x^N) = f(x^1) + \ldots + f(x^N).$$

Chapter 4

107^4: This formula should be

$$\nabla_{\frac{\partial}{\partial\theta^k}}\left(\frac{\partial}{\partial\theta^j}\right) = \ldots$$

112^5: otho should be ortho

115_3: All the n's in this formula should be q's.

116^{11}: Here the symbol 1 is the identity map.

116^{15}: