Errata: Nonholonomic Mechanics and Control
1st Edition, 1st Printing
Version: May 7, 2006

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This file contains the errata known to us as of the above date for the first printing of the 1st edition (2003). These errata will be corrected in the second printing.

Introduction

Page 1, Line 11 : Insert a closing parenthesis after “whole” and a comma after “law”.

Pages 6,7 Section 1.2 : Interchange a and b in the endpoints of the integrals for consistency.

Page 9, first line of paragraph “Energy and Hamilton’s Equations” : There is a missing partial before $\dot{q}_j$.

Page 10, 3rd last line, last displayed equation : Replace $\Gamma_{lm}^r$ with $\Gamma_{rlm}^r$.

Page 11, 5 lines from bottom : $F_i$ should be $F_i$.

Page 18, displayed equation lines before displayed equation (1.4.4) : Second equation should have an $m$ before the $R^2$.

Page 20, equation (1.4.9) : This equation should read

$$J \ddot{\varphi} - R\mu_1 \dot{\theta} \sin \varphi + R\mu_2 \dot{\theta} \cos \varphi = u_\varphi$$

Page 23, Figure 1.6.1 : Interchange $x$ and $y$ on the axes.

Page 26, Line 8 : $J$ should be $I$.

Page 27, 8 lines after (1.7.4) : Replace “and one negative eigenvalue” with “together with a negative eigenvalue if $v > 0$ and a positive eigenvalue if $v < 0.”

Page 27, Figure 1.7.2 : Labeling of axes should be interchanged i.e. $v$ and $\omega$ should be swapped.

Page 30, Equation (1.8.8) : $xu_2 - yu_1$ should read $yu_1 - xu_2$.

Page 32, First line after second display : Replace $x$ by $q$, three times.

Page 33, Three lines below equation (1.8.16) : $\dot{z} = x\dot{y} - y\dot{x}$ should be $\dot{z} = y\dot{x} - x\dot{y}$.

Page 34, Lines 4 and 5 : Remove the minus signs in both places.

Page 34, Two lines below (1.8.17) : In the display, $ta^2$ should be $a/2\pi$.

Page 36, 37 First equation of (1.9.8) and of (1.9.9) : Multiply $\lambda_1$ and $\lambda_2$ by $a$. Also, on the first and last line of (1.9.9), $\hat{\omega}$ should be boldface: $\hat{\omega}$. 
Page 39, Equation (1.9.21): Eliminate the extra parenthesis right after $K$.

Page 45, Displayed equation for $H$ above (1.12.1): The parenthesis at the end of this line should not be a subscript; i.e. $x_{k+1}$ should be $x_{k+1}$.

Page 46, Displayed equation for $B$ below (1.12.6): In the last row of the matrix $B$, $a_{n-1}$ should be $-a_{n-1}$.

Chapter 2

Page 59, first line of Proposition 2.1.9: $(M)$ should be $(U)$.

Page 64, Paragraph in middle: The title of the paragraph should be “Level Sets as Differentiable Manifolds in $\mathbb{R}^n$.”

Page 68, equation (2.2.1): After $Df(u)$ there should be $\cdot$ not a comma.

Page 74, title of section 2.4: Title should be “Center Manifolds” and the words “Theory and the Lyapunov-Malkin Theorem” should be removed from the first line of the section.

Page 78: Exercise 2.4.1 In the first line of displayed equation, $y^2$ should be $xy$. There is a similar correction in the caption of the accompanying figure 2.4.2.

Page 85, 4th line of exercise 2.5-2: $x, y, z$ should all in the denominator with with $\partial$.

Page 87, 2nd last line: “Jacobi Lie bracket” repeated (index problem).

Page 92: Exercise 2.6-1: There is a lettering problem: remove the (a) (this is not an exercise). Then (b) should be (a) as so on. Also the $\beta$ is the current part (e) should $\alpha$.

Chapter 3

Page 122: Last displayed formula: $P_i$ should be $p_i$.

Page 137: Line after (3.7.5): $\xi_Q(q^n)\ldots$ should be $\xi_Q(q)\ldots$.

Page 143: 4 lines after displayed equation (3.9.5): Delete the minus sign in front of $\nabla \times A$.

Page 146: equation (3.10.18) should read as follows (swap the arguments on the right hand side):

\[
\text{ver}_q v = [A(q, v)]_Q(q) = \left( \dot{s} - \frac{\beta}{\gamma} \cos \theta \dot{\theta}, 0 \right),
\]

\[
\text{hor}_q v = v - \text{ver}_q v = \left( \frac{\beta}{\gamma} \cos \theta \dot{\theta}, \dot{\theta} \right)
\]

and the $A$ at the end of the example should be $A$.

Page 162, equation (3.13.11): Last term in square brackets should be squared; i.e. $||\dot{r}_1||^2$. 

Chapter 4

Page 180, Line below (4.2.7) : Delete the duplicate appearance of \([g_2, [g_1, f]](\Omega)\).

Page 205, equation (4.6.18) : Delete the last parenthesis.

Chapter 5

Page 217, two lines before (5.2.3) : Instead of “choose, in a neighborhood of each point, a local coordinate chart...” put rather “choose local coordinates”

Chapter 7

Page 331, line after (7.1.4) : One “of” should be deleted.

Chapter 8

Page 392, Line following equation (8.6.1) : \(p = I_{ab}\omega^b\) should be \(p_a = I_{ab}\omega^b\).

Chapter 9

Page 403, equation (9.2.2) and the following displayed equation : \(\lambda^2\) should be \(\lambda_2\) and \(\frac{1}{2} \xi_2^2\) should be \(\frac{1}{2} \xi_3^2\).

Page 403, fourth line from the bottom : \(\Pi_2\) should be \(\Pi_3\).

Page 405, tenth line : Close parentheses after “below”.

Bibliography

Page 440, Appell 1911 reference : “lews” should be “les”,

Page 452, Helmke reference : Authors in the reference should be Hemlke, U. and J. Moore.

Page 463, Rumiantsev 1966 reference : Valentin should be V. for consistency.

• See the book’s website [http://www.cds.caltech.edu/mechanics_and_control/] for additional bibliography