Trajectory Planning for Automatic Machines and Robots

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Errata

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Conventions: each line of text (including figures' captions) and each line of a displayed equation are counted as a line. Negative line numbers mean number of lines from the bottom of the page. First line on page = 1, last line on page = -1.

- Page 48, line -1. (October 23, 2009) In the expression for the computation of $\mathtt{v}_c$ an exponential function is missing. The right expression is

$$\mathtt{v}_c = \frac{1}{2\displaystyle\int_0^{\frac{1}{2}} e^{-\sigma f(\tau,\lambda)} d\tau}.$$

- Page 49, line 6. (October 23, 2009) In the expression of the acceleration $\ddot{q}_N(\tau)$ of the normalized trajectory, the sign d of the derivative is missing. The correct expression is

$$\ddot{q}_N(\tau) = -\mathtt{v}_c\,\sigma\,\frac{df(\tau,\lambda)}{d\tau} e^{-\sigma\, f(\tau,\lambda)}.$$

- Page 89, lines 12-16. (November 3, 2009) The expression of the double S trajectory for $t \in [T - T_d + T_{j2},\, T - T_{j2}]$ can be simplified in the following way

$$\begin{cases} q(t) &= q_1 - \mathtt{v}_1(T-t) + \dfrac{\mathtt{a}_{lim_d}}{6}\Big(3(T-t)^2 - 3T_{j2}(T-t) + T_{j2}^2\Big) \\ \dot{q}(t) &= \mathtt{v}_1 - \mathtt{a}_{lim_d}\left(T - t - \dfrac{T_{j2}}{2}\right) \\ \ddot{q}(t) &= -\mathtt{j}_{max} T_{j2} = \mathtt{a}_{lim_d} \\ q^{(3)}(t) &= 0 \end{cases}$$

- Page 91, Fig 3.18. (David Richter, June 25, 2013) The rectangular block with the text: "Compute the trajectory parameters according to (3.26a), (3.26b) and (3.26b)" should say "Compute the trajectory parameters according to (3.26a), (3.26b), and (3.26c)".

- Page 179, Example 4.9 (Philip Freeman, October 22, 2010). The numerical values of matrix $\boldsymbol{A}$ and vectors $\boldsymbol{c}$ and $\boldsymbol{\omega}$ are wrong. The right expressions result

$$\boldsymbol{A} = \begin{bmatrix} 15 & 2.5 & 0 & 0 & 0 & 0 & 0 \\ 0 & 9 & 2 & 0 & 0 & 0 & 0 \\ 0 & 2 & 6 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 6 & 2 & 0 & 0 \\ 0 & 0 & 0 & 2 & 14 & 5 & 0 \\ 0 & 0 & 0 & 0 & 5 & 13 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 9 \end{bmatrix},$$

$$\boldsymbol{c} = \left[\begin{array}{cccccccc} -36, & 15, & 39, & -12, & -10.8, & -5.2, & -20 \end{array} \right]^T$$

and

$$\boldsymbol{\omega} = \left[\begin{array}{cccccccc} -2.42, & 0.12, & 6.98, & -3.09, & -0.22, & -0.32, & -2.17 \end{array} \right]^T.$$

- Page 326, line 14. (March 30, 2010) The transfer function $G(s) = \dfrac{2s+1}{s^2+2s+100}$ must be changed in $G(s) = \dfrac{2s+100}{s^2+2s+100}$.

- Page 329, line -6. (March 30, 2010) It is necessary to specify the meaning of n_i. Therefore at the end of the sentence "where the pairs $(p_i, p_i^\star)$ represent the (complex conjugate) poles of $G(z)$" it is necessary to add "of multiplicity n_i".

- Page 329, line -4. (March 30, 2010) Under the first block of the figure it is necessary to replace $(\omega\psi_{n1}, \delta_1)$ with (ω_{n1}, δ_1).

- Page 409, line 7. (Pedro Reboredo, July 6, 2009) In the expression of $\boldsymbol{a}_4 = 5\boldsymbol{p}_0 - 4\boldsymbol{p}_1 + 6\boldsymbol{p}_2 - 4\boldsymbol{p}_3 + \boldsymbol{p}_4$ the coefficient of $\boldsymbol{p}_0$ is 1 and not 5, therefore the right expression is $\boldsymbol{a}_4 = \boldsymbol{p}_0 - 4\boldsymbol{p}_1 + 6\boldsymbol{p}_2 - 4\boldsymbol{p}_3 + \boldsymbol{p}_4$.

- Page 411, line -6. (Jenuary 16, 2014) The coefficient c is not equal to zero. Therefore, $c = -900 \left|\boldsymbol{p}_{5,k} - \boldsymbol{p}_{0,k}\right|^2$.

- Page 425, line 13. (July 15, 2014) The expression $q(t_f) = \ldots$ should be $q(t_{max}) = \ldots$.

- Page 425, line -2. (July 15, 2014) The expression $q(t_f) = 0$ should be $q(t_{min}) = 0$.

- Page 486, line 15. (Pedro Reboredo, July 6, 2009) In the expression of $\boldsymbol{a}_4 = 5\boldsymbol{p}_0 - 4\boldsymbol{p}_1 + 6\boldsymbol{p}_2 - 4\boldsymbol{p}_3 + \boldsymbol{p}_4$ the coefficient of $\boldsymbol{p}_0$ is 1 and not 5, therefore the right expression is $\boldsymbol{a}_4 = \boldsymbol{p}_0 - 4\boldsymbol{p}_1 + 6\boldsymbol{p}_2 - 4\boldsymbol{p}_3 + \boldsymbol{p}_4$.

- Page 467, line 11. (September 6, 2009) The word "coefficient" should be plural.