

Errata: Feature-Based Locomotion Controllers

Martin de Lasa

November 30, 2011

Below are a few errata from our paper that do not match equations used to generate results described in the paper and demonstrated in the accompanying video.

Equations 10-14 in the paper are incorrect. The last paragraph of the **Angular Momentum** section should read:

To calculate $\dot{\mathbf{L}}$, we express the AM about the COM as:

$$\mathbf{L} = \mathbf{P}\mathbf{J}\dot{\mathbf{q}} \quad (10)$$

$$\mathbf{P} = [\mathbf{I}_1 \quad m_1(\mathbf{p}_1 - \mathbf{c}) \times \quad \dots \quad \mathbf{I}_n \quad m_n(\mathbf{p}_n - \mathbf{c}) \times] \quad (11)$$

$$\mathbf{J} = [\mathbf{J}_1^T \quad \dots \quad \mathbf{J}_n^T]^T \quad (12)$$

where \mathbf{I}_i is the inertia of link i about the COM, m_i is the mass of link i , \mathbf{p}_i is the position of link i 's COM, \mathbf{c} is the position of the system COM, \mathbf{J}_i maps joint velocities to spatial velocities about each link's COM, and $\dot{\mathbf{q}}$ is the vector of joint velocities. Differentiating (10), we obtain:

$$\dot{\mathbf{L}} = \mathbf{P}\mathbf{J}\ddot{\mathbf{q}} + (\dot{\mathbf{P}}\mathbf{J} + \mathbf{P}\dot{\mathbf{J}})\dot{\mathbf{q}} \quad (13)$$

$$\dot{\mathbf{P}} = [\omega_1 \times \mathbf{I}_1 - \mathbf{I}_1 \omega_1 \times \quad m_1(\mathbf{v}_1 - \dot{\mathbf{c}}) \times \quad \dots \quad \omega_n \times \mathbf{I}_n - \mathbf{I}_n \omega_n \times \quad m_n(\mathbf{v}_n - \dot{\mathbf{c}}) \times] \quad (14)$$

where ω_i is the angular velocity of the i^{th} link, \mathbf{v}_i is the linear velocity of link i 's COM, and $\dot{\mathbf{c}}$ is the velocity of the system COM. All of the above quantities are expressed in the world reference frame.

We thank Marco Da Silva for bringing this error to our attention.

There is a sign error in Equations 7 of the **Target Objective** section. It should read:

$$\begin{bmatrix} T^2/3 & T^2/6 \\ T/2 & T/2 \end{bmatrix} \begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} y_T - y_0 - \dot{y}_0 T \\ \dot{y}_T - \dot{y}_0 \end{bmatrix}. \quad (7)$$

We thank Oscar Efrain Ramos Ponce for bringing this error to our attention.