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CORRECTION

Correction to: On the use of adjoint gradients for time-optimal control problems regarding a discrete control parameterization

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Equations 62–64 were correct as the formula was deemed wrong. The updated equations are as follows:

$$\delta W_i = M_i \delta\theta = M_i \frac{\partial\theta}{\partial \mathbf{q}} \delta\mathbf{q} = \mathbf{Q}_i^\top \delta\mathbf{q}, \tag{62}$$

$$\mathbf{Q}_u = u \left(\frac{\partial\theta}{\partial \mathbf{q}} \right)^\top, \tag{63}$$

$$\mathbf{Q}_d = f_d \left(\frac{\partial\theta}{\partial \mathbf{q}} \right)^\top. \tag{64}$$

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The symbol ω in the sentence just before Eq. (66) and in Eq. (66) is changed to $\mathbf{v}$ to avoid misunderstanding. The following paragraph contains that symbol change.

Introducing the generalized velocities $\mathbf{v} = \dot{\mathbf{q}}$ as additional variables transforms the second-order differential equation for $\mathbf{q}$ into a first-order system

$$\begin{pmatrix} \mathbf{I} & \mathbf{0} \\ \mathbf{0} & \mathbf{M} \end{pmatrix} \begin{pmatrix} \dot{\mathbf{q}} \\ \dot{\mathbf{v}} \end{pmatrix} = \begin{pmatrix} \mathbf{v} \\ \mathbf{Q}_u + \mathbf{Q}_d - \mathbf{Q}_k \end{pmatrix}. \tag{66}$$

Declarations

Competing Interests The authors declare no competing interests.