

+ Utils

+ RKA

Double Pendulum

Values $m_1 := 1$ $L_1 := 1$ $\theta_1^b := \frac{\pi}{2}$ $g := 9.82$ $t_{end} := 8$

$m_2 := 0.5$ $L_2 := 0.2$ $\theta_2^b := \frac{\pi}{2}$

ODE Solver

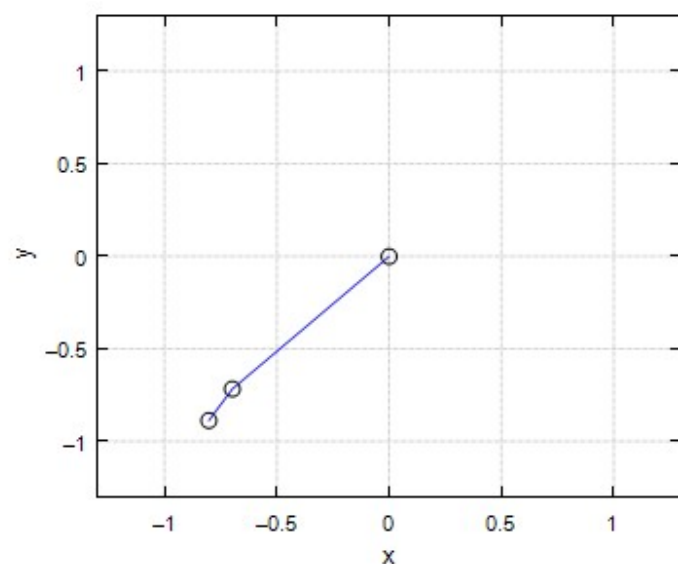
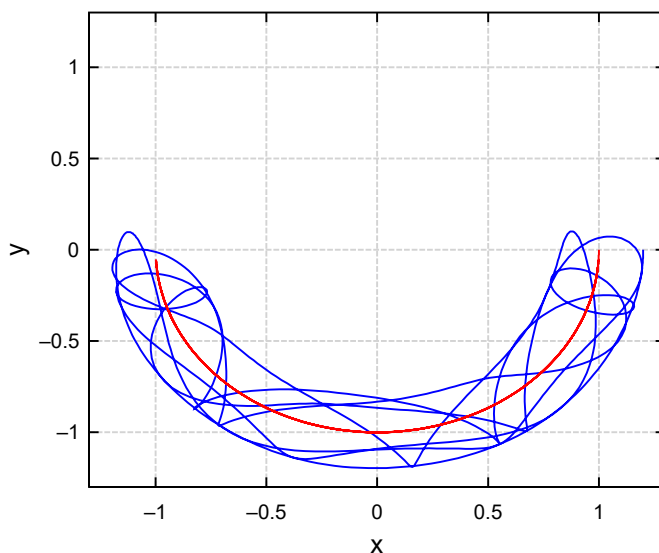
$$\left\{ \begin{array}{l} m_2 \cdot L_2 \cdot \theta_2''(t) + m_2 \cdot L_1 \cdot \theta_1''(t) \cdot \cos(\theta_1(t) - \theta_2(t)) = \\ = m_2 \cdot L_1 \cdot (\theta_1'(t))^2 \cdot \sin(\theta_1(t) - \theta_2(t)) - m_2 \cdot g \cdot \sin(\theta_2(t)) \\ \theta_2(0) = \theta_2^b \quad \theta_2'(0) = 0 \\ (m_1 + m_2) \cdot L_1 \cdot \theta_1''(t) + m_2 \cdot L_2 \cdot \theta_2''(t) \cdot \cos(\theta_1(t) - \theta_2(t)) = \\ = m_2 \cdot L_2 \cdot (\theta_2'(t))^2 \cdot \sin(\theta_2(t) - \theta_1(t)) - g \cdot (m_1 + m_2) \cdot \sin(\theta_1(t)) \\ \theta_1(0) = \theta_1^b \quad \theta_1'(0) = 0 \end{array} \right.$$

$$U := \text{RKA} \left(\left\{ \begin{array}{l} \theta_1(t) \\ \theta_2(t) \end{array} \right\}', \left[\begin{array}{l} 0 \\ 0 \end{array} \right], t_{end}, 1000 \right)$$

$$\left[\begin{array}{c} T \\ \theta_1 \\ \theta_2 \end{array} \right] := \left[\text{col}(U, 1) \text{col}(U, 2) \text{col}(U, 4) \right] \quad n := [1 \dots \text{rows}(U)]$$

Position

$$\begin{array}{ll} x_1 := \overrightarrow{L_1 \cdot \sin(\theta_1)} & y_1 := \overrightarrow{-L_1 \cdot \cos(\theta_1)} \\ x_2 := \overrightarrow{x_1 + L_2 \cdot \sin(\theta_2)} & y_2 := \overrightarrow{y_1 - L_2 \cdot \cos(\theta_2)} \end{array}$$



Alvaro

appVersion(4) = "1.75.9678.0"