

CONTROLLING THE OSCILLATIONS OF A VARIABLE LENGTH PENDULUM

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- *ABSTRACT: An efficient method for stopping a pendulum's planar oscillations by variations in the pendulum's length is found. This strategy is accomplished by casting the problem as an optimal control problem. The pendulum's governing equations are deduced and using these equations the oscillation energy of the pendulum is found. The problem becomes a variational problem with constraints in which a functional which represent the oscillation energy of the pendulum is to be minimized. Using Pontryagin's Principle, optimal solutions are found. Finally, the effectiveness of the found strategies is illustrated graphically; analytical and numerical comparisons are made.*
- *KEYWORDS: Pendulum of variable length; oscillation energy; Pontryagin principle.*

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