

## Nonlinear control of an inverted pendulum actuated by two reaction wheels

**Joao Francisco Silva Trentin, Samuel da Silva, Jean Marcos de Souza  
Ribeiro, Hanspeter Schaub**

*Abstract:* Reaction wheels have been extensively used to control and stabilize a wide range of applications. This paper studies the performance of the use of two reaction wheels for controlling an inverted pendulum. The model for this pendulum configuration and a nonlinear controller designed using Lyapunov theory are presented. Moreover, the controller has an attractive feature of choosing how each reaction wheel may be actuated. Therefore, the difference of actuating of the pendulum is evaluated online using two reaction wheels or using one at a time. A full detailed analysis of the simulated results is discussed to explain the differences in the use of the actuators.

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- <sup>1)</sup> Joao Francisco Silva Trentin, M.Sc. (Ph.D. student): São Paulo State University - UNESP, Avenida Brasil Sul 56, Ilha Solteira, São Paulo. Postal code: 15385-000., Brazil (BR), joao.trentin@unesp.br, the author presented this contribution at the conference in the special session: "Nonlinear behavior, performance, and control designs for complex structures in Civil, Aeronautical, Aerospace and Ocean Engineering" organized by J.M. Balthazar, E. Jarzębowska and A.M. Tusset.
  - <sup>2)</sup> Samuel da Silva, Associate Professor: São Paulo State University - UNESP, Avenida Brasil Sul 56, Ilha Solteira, São Paulo. Postal code: 15385-000., Brazil (BR), samuel.silva13@unesp.br.
  - <sup>3)</sup> Jean Marcos de Souza Ribeiro, Associate Professor: São Paulo State University - UNESP, Avenida Brasil Sul 56, Ilha Solteira, São Paulo. Postal code: 15385-000., Brazil (BR), jean.ribeiro@unesp.br.
  - <sup>4)</sup> Hanspeter Schaub, Professor: University of Colorado Boulder, Boulder, Colorado. Postal code: 80309-0431, United States (US), hanspeter.schaub@colorado.edu.