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Leges Motus*



Seminar über Fragen der Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Dienstag, **17.09.2019, 11:00 Uhr**, Immerwahrstr. 1, Raum 01.025

Swing up and Stabilization of a triple inverted pendulum on a cart with experimental validation

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The triple pendulum on a cart is an interesting, non-linear system with chaotic motion behavior. Due to these characteristics, the upswing and stabilization of the system is an extremely challenging control engineering task. The upswing and stabilization of the triple was successfully carried out as part of this work. As a first step a mathematical model had to be built up. The parameters of this model must then be precisely identified and thoroughly tested. Using this model, various trajectories were generated using the novel DMOC "Discrete Mechanics and Optimal Control" method and tested on the testbench. Due to the fact that systems in the reality are not ideal, a suitable controller is designed to compensate for model uncertainties and external disturbances. In this work a time-variant linear quadratic regulator (LQR) was chosen for this task. At the end of this work the response of this controller was checked for its repeatability and possible methods to improve it were sought.

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