



SAPIENZA
UNIVERSITÀ DI ROMA

DEPARTMENT OF COMPUTER, CONTROL AND
MANAGEMENT ENGINEERING

FP1
Control of the
Variable Length Pendulum
UNDERACTUATED ROBOTICS

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1 Introduction

Ch. 8.1. Introduction [1].

2 Problem Formulation

Ch. 8.2.

3 Total Energy Shaping

Ch. 8.3.1.

3.1 Experiments

Ch. 8.5 (singular points in controller 8.18).

4 Partial Energy Shaping

Ch. 8.3.2.

4.1 Motion Analysis

Ch. 8.4 (Convergence of Energy in 8.4.1, Closed-Loop Equilibrium Points in 8.4.2).

4.2 Experiments

Ch. 8.5 (controller 8.23 with initial state $(-\pi/6, 2, 0, 0)$ and $(-\pi/3, l_{de}, 0, 0)$).

5 Conclusion

Ch. 8.6.

References

- [1] X. Xin and Y. Liu, *Control Design and Analysis for Underactuated Robotic Systems*. Springer Publishing Company, Incorporated, 2014.