

“Projektwettbewerb Einführung in die Regelungstechnik” - Stabilisierung eines Segways auf einer Wippe

Alessio Gaggiano, Shadi Rafe, Truc-Quynh Doan (Group 2)

Abstract: Die folgende Dokumentation beinhaltet die ausführliche Beschreibung unseres Lösungsansatzes der regelungstechnischen Aufgabe ”Stabilisierung eines Segways auf einer Wippe”.

1. INTRODUCTION

We have designed a state feedback for the single-track model based on inverse kinematics, loop-shaping, feedback linearization, and robot navigation functions.

2. MAIN IDEA

Our design procedure was based on the idea that accelerating a vehicle results in shorter lap times than braking a vehicle. For presentational conciseness, we have listed some important parameters in Table 1.

Table 1. Important Parameters.

Parameter	Value
lap time t_f	∞
control gain k	0
steering angle δ	$-(e^{i\pi} + 1)$

3. RESULT

We have achieved a lap time of $t_f = \infty$. We have depicted a plot of vehicle velocity v versus an independent curve parameter γ , with which we have parameterized the racetrack, in Fig. 1.

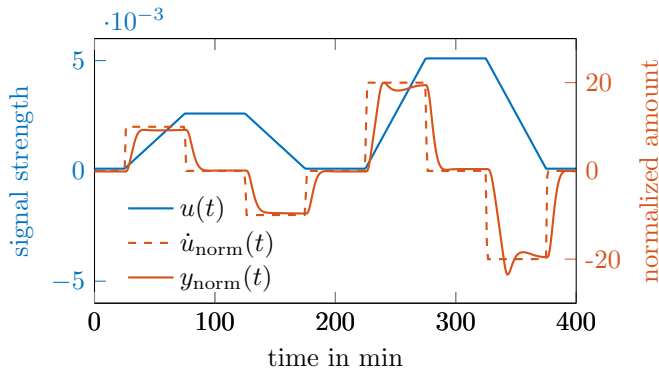


Fig. 1. Some arbitrary plot (using tikz) which doesn't have anything to do with Projektwettbewerb ERT.

REFERENCES

Knuth, D. E. (2005). The Art of Computer Programming. Pearson Education.

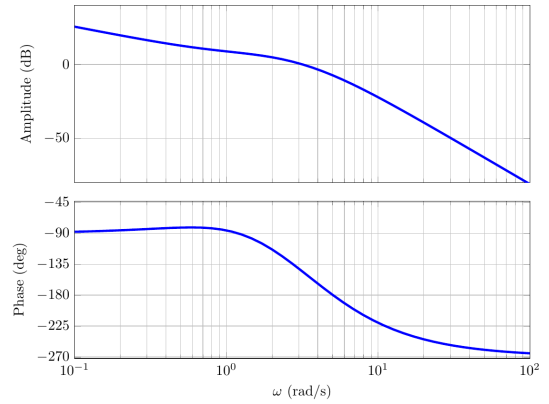


Fig. 2. Some arbitrary plot (using png) which doesn't have anything to do with Projektwettbewerb ERT.