

Advanced Robot Control

Introduction

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1 Introduction

2 Literature

Credit rules

Lecture ends with a final test during the last lecture. Two attempts are possible:

- 1 the lecture next to the last one,
- 2 the last lecture.

Grade from the second attempt cancels out the grade from the first attempt.

Lecture attendance is appreciated but not mandatory to pass the final test.

Website

Additional information about this course is available at `edu.domski.pl` (available in English).

You have to go to *Courses->Advanced Robot Control* tab and select *lecture* or *laboratory classes*

Office hours

Office hours are available via USOS system.
The office hours are held in room 209A, building C3.

Course outline

The course covers following subjects:

- input–output decoupling method for a manipulator,
- static linearisation,
- dynamic linearisation,
- model predictive control,
- introduction to real-time operating systems,
- embedded system design,
- system decomposition,
- implementation of robot controller on a microcontroller.

Literature

- Siciliano, B. and Khatib, O., *Handbook of Robotics*, 2007, Springer,
- Ben-Ari, M. and Mondada, F., *Elements of Robotics*, 2018, Springer,
- Åström, K. J. and Hägglund, T., *PID Controllers: Theory, Design, and Tuning*, 1995, Instrument Society of America,
- Real Time Engineers Ltd., *The FreeRTOS™ Reference Manual*, 2016,
- Bräunl, T., *Embedded Robotics*, 2008, Springer,
- Wescott, T., *Applied Control Theory for Embedded Systems*, 2006, Elsevier,
- Ławryńczuk, M., *Nonlinear Predictive Control Using Wiener Models*, 2022, Springer Cham,
- C. C. de Wit, B. Siciliano, and G. Bastin., *Theory of Robot Control*, 1996, Springer-Verlag London,
- lecture notes,
- manufacture manuals.