

Training Advanced motion control

This training starts on: 26-10-2020

Location: TU/e, Eindhoven
Price: 3.750,00 euro excl. VAT
Duration: 5 consecutive days
Contact: training@hightechinstitute.nl, +31 85 401 3600

Overview

The performance of controlled mechanical servosystems in an industrial setting is generally achieved by using PID+ controllers, which are designed using time and frequency responses. In drive systems with more than one axis, it is important to understand if one needs to consider interaction between the axes in the design, and if so, who to tackle the controller design challenge.

This course starts with a short recap of the basic course 'Motion control tuning' for a SISO (single axis) situation, followed by the analysis and control of the multivariable situation including an in-depth treatment of the interaction analysis, de-coupling and MIMO control. The knowledge will be applied to the hands-on case of a mechanical (2 axes) servo problem and all relevant aspects incl. advanced feedforward will be treated.

Intended for

This course is targetted at engineers that are involved in controlled mechanical servo systems and need to better understand what the achievable performance is, how to reach it via use of adequate controllers and which factors limit the performance.

Participants have a Bachelor or Master education in electrical engineering, mechanical engineering, mechatronics, physics or equivalent practical experience and need a solid basic understanding of servo control. Preferably, they have followed the course 'motion control tuning'.

Objective

After completion of the course, you are capable of analyzing an industrial multivariable servosystem and designing an adequate control. Based on measurements you can determine if and to what extend the interaction between the axes is a problem. You will be able to apply a stepwise approach to find adequate settings of a multivariable controller, to determine the achievable performance of the controlled system and to understand what limits this performance.

Programme

The course consists of a mixture of lectures, demonstrations, exercises and experiments. For the exercises a userfriendly Matlab application is used, whereas the experiments are performed with RTLinux based instrumentation.

The following topics are treated:

- Recap SISO motion control tuning
- Interaction analysis
- MIMO frequency response
- Linear calculus

Information is subject to change. Please contact High Tech Institute for the latest course information and time schedule.

Partner

Certified by

Euspen

Certification

This course is certified by the European society for precision engineering & nanotechnology (euspen) and the Dutch Society for Precision Engineering (DSPE) and leads to the ECP2-certificate.

Course leaders

Dr. Tom Oomen
Dr. Ton van der Weiden

Teachers

Prof. Maarten Steinbuch
Dr. Ton van der Weiden
Dr. Tom Oomen
Prof. Dr. ir. Marcel Heertjes
Dr. Joost Bolder
Robbert van Herpen MSc
Dr. Rick van der Maas
Dr. Marc van de Wal
Dr. David Rijlaarsdam
Dr. Michiel Beijen
Robert van der Weijst MSc
Dr. Rolf Gaasbeek
Lennart Blanken
Enzo Evers MSc
Robin de Rozario MSc
Jurgen van Zundert MSc
Nard Strijbosch
Noud Mooren

Timetable

26-10-2020 | 09:00 - 17:00
27-10-2020 | 09:00 - 17:00
28-10-2020 | 09:00 - 17:00
29-10-2020 | 09:00 - 17:00
30-10-2020 | 09:00 - 17:00

- MIMO stability
- De-coupling
- Sequential loop closing
- Experimental evaluation
- Model based design
- Advanced feedforward