Computation Exercise

- **Successful completion of the computational exercises is a prerequisite for the admission to the final exam.**
- To pass the computation exercises, **a positive result is required for all the following exercises**.
  - Computation exercise 1: Dynamics
  - Computation exercise 2: Actuator
  - Computation exercise 3: Control design

Computation Exercise 3

- For computation exercise 3, two assignments are available and one of them should be selected
  - Computation exercise 3(a): System with Lorentz actuator
  - Computation exercise 3(b): System with piezo actuator
- Submission of the exercise
  - Deadline: 20th of January at 4PM (No grace period).
  - Deadline: 14th of January at 10AM for students who take the final examination on January 16th, so that the results are available earlier. (Please contact Shingo Ito, if there is a problem.)
  - Answers must be hard copy and submitted to the mail box for Shingo Ito in CA0421.
  - Strongly recommended to work alone. (Don't copy)

Computation Exercise 3

- It is expected that a software (e.g. MATLAB) is used for the computation exercises.
  - Student licenses are available with a reasonable price at “Zentraler Informatikdienst”.
  - Computers with MATLAB and Maple may be available at the computer laboratory (CA0426). Please talk to Shingo Ito after the lecture for reservation.

Computation Exercise 3(a)(b): V and Vi

First four problems have been presented on December 17th.

Exercise 3(a): $C(s) = C_{PID}(s)C_{notch}(s)$.

Exercise 3(b): $C(s) = C_I(s)C_{notch}(s)$.

The rest of the problems are given as follows:

v. To implement C(s) designed in (iii) as a digital filter on a microcontroller running at a sampling frequency of 800Hz, discretize C(s). Special care should be taken not to change the notch frequency and the cross over frequency. For validation, show Bode plots of the continuous and the discrete controller (i.e. C(s) and C(z)) on one figure. [20 %]

vi. To implement C(z) with gains and memories (time delays), draw a block diagram showing an IIR filter structure and derive the coefficients of the gains. [20 %]