Master of science-level in Mechanical Engineering
Academic Year 2019-2020, Second Semester

Automatic Control (05LSLQD, 05LSLNE)

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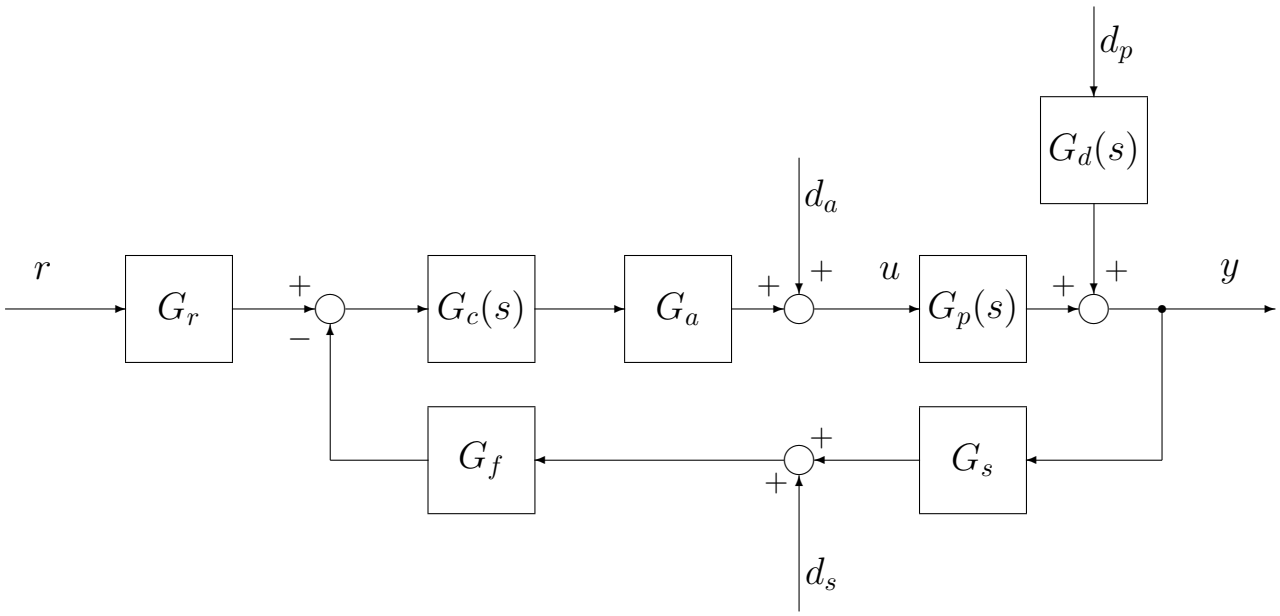
Homework n. 6

Main learning objectives

Upon successful completion of this homework, students will

1. Be able to design a cascade controller G_c through loop-shaping design techniques (generalized steady-state gain K_c, phase-lead, phase-lag).
2. Be able to derive a simulink model for the simulation of the designed feedback control system.
3. Be able to provide accurate graphical and numerical documentation of time domain performance of the designed feedback control system.

Consider the feedback control system below.



For problem $P1$ to problem $P8$ (see Homework No. 5), students are asked to:

(a) Analyze and translate steady-state and transient requirements (specifications).

(b) Design a cascade controller G_c and a feedback controller G_f trying to meet all required specifications, through loop-shaping design techniques.

(c) Check, through time simulation of the feedback control system, that all required specifications are really met.

(d) Provide accurate graphical and numerical documentation of time domain performance of the designed feedback control system, even if requirements are not satisfied.