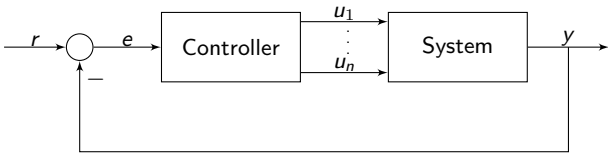
Split-range Control for Applications with 2 Manipulated Control Variables

TECHNISCHE UNIVERSITÄT DARMSTADT

Bachelor's Thesis

Traditional PID controllers map the deviation of a single system output (or controlled variable) from a given reference value to a single system input (or manipulated variable). Given an appropriate tuning of the PID parameters, this setting works quite well in many application cases. Problems arise when a system output can be influenced by two or more manipulated variables. Application cases for this are, e.g., temperature control using cold and hot water, pH neutralization processes using acid and base, or pressure control. Here, more advanced control configurations need to be applied. Split-range control is one of these and shall be investigated in this work.



Your main tasks will be:

1. Literature review on split-range control
2. Implementation of split-range control in Python (preferably HILO-MPC[1])
3. Comparison to other control configurations

Picture taken from https://instrumentationtools.com

Experience with / knowledge about:	Control theory
Programming skills:	Python (good to very good skills required)
Language:	English (thesis and presentation), German

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1 https://www.ccps.tu-darmstadt.de/research_ccps/hilo_mpc/index.en.jsp

CCPS Control and Cyber-Physical Systems