Course overview
Systems theory
Real life examples
Control theory
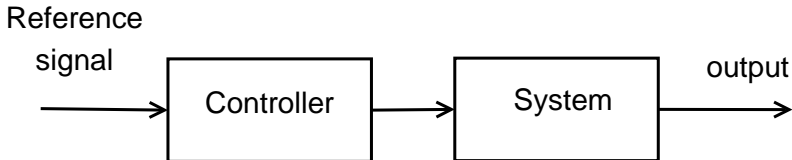Open-loop vs. closed-loop systems
Automatic control

Outline

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Open loop

In an open loop system, the output is not fed back into the
controller. Therefore, the controller cannot *'see'* the effect of its
actions.
This way it is hard to get the desired output.

Reference
signal

⟶ | Controller | ⟶ | System | ⟶ output

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Take for example the following system:

- You are pouring a glass of water, but you **cannot look at the glass**.
- The desired output is a full glass of water within a reasonable time.
- The input can have two values: on or off (assume a quite primitive tap).
- It will not be easy to do this successfully.

The solution is evident: look at the glass while pouring!

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Closed loop (feedback)

In a closed loop system, the error signal, which is the difference between the input signal and the output, is fed to the controller so as to reduce the error and bring the output to the desired value.
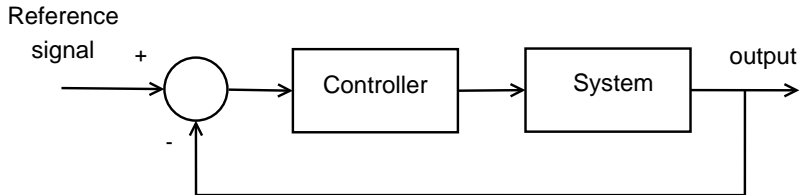
There are two types of feedback systems. The output can either be added to the reference input (positive feedback) or substracted from it (negative feedback).