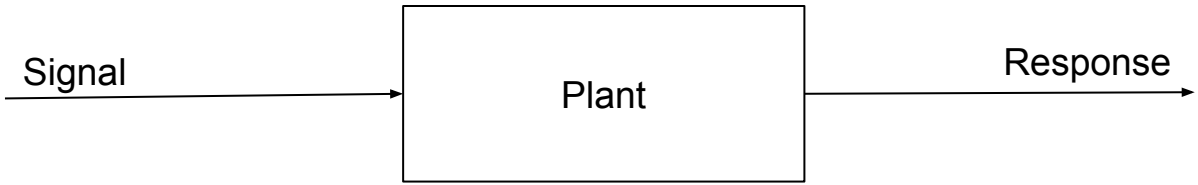
Robotics I

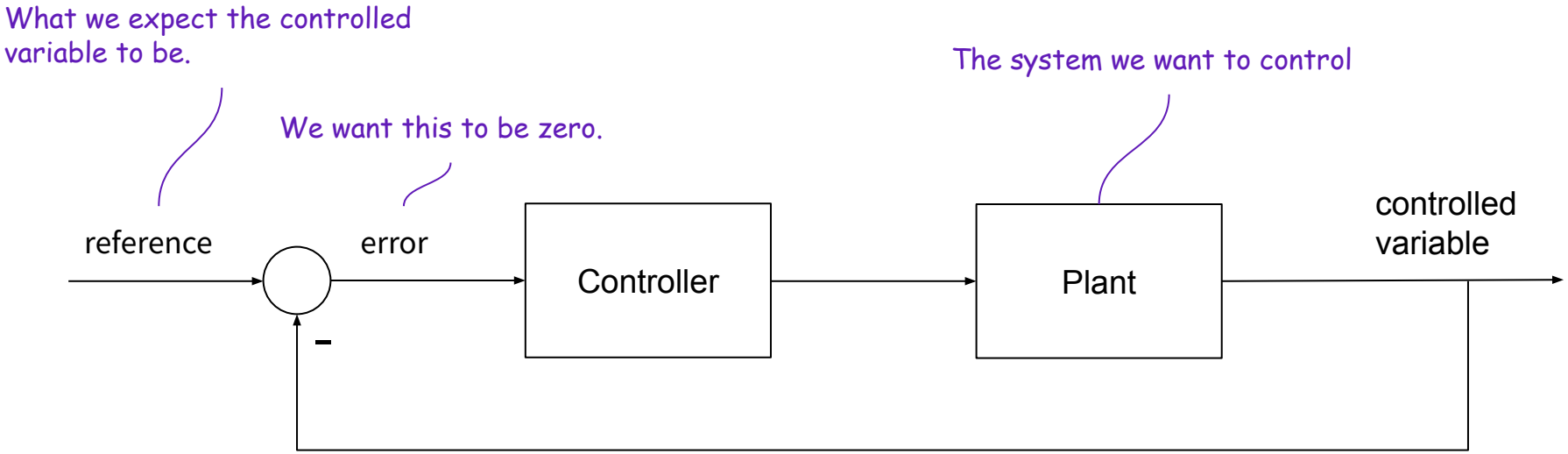
PID Control

11/16/2021

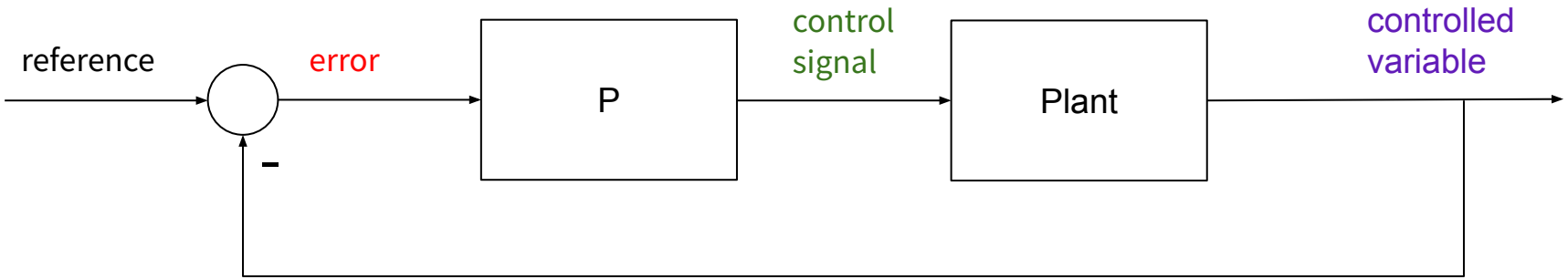
System

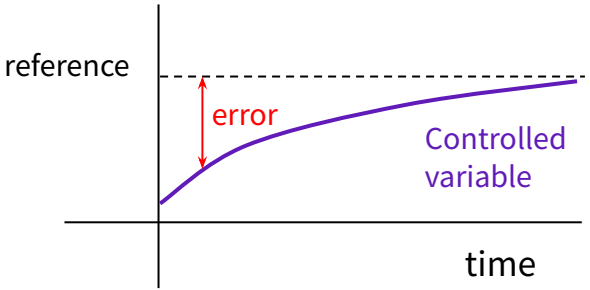


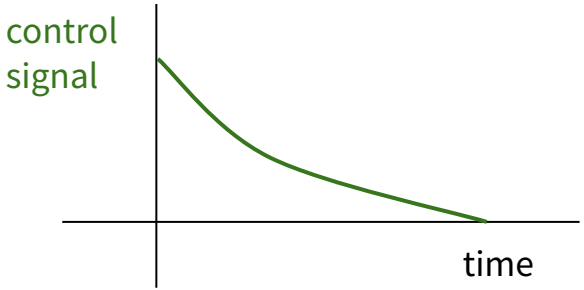
Feedback Control



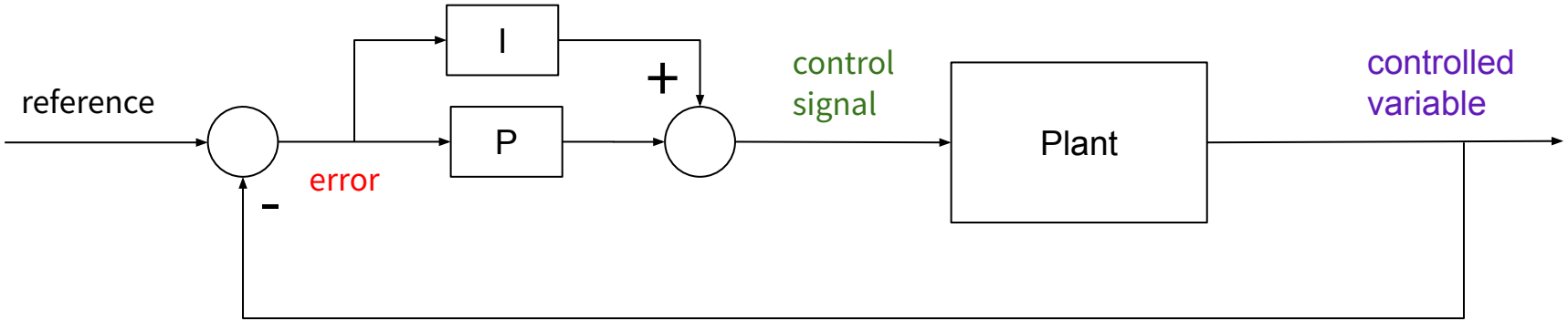
Proportional Controller

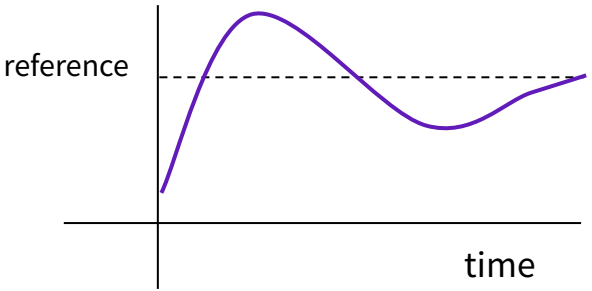


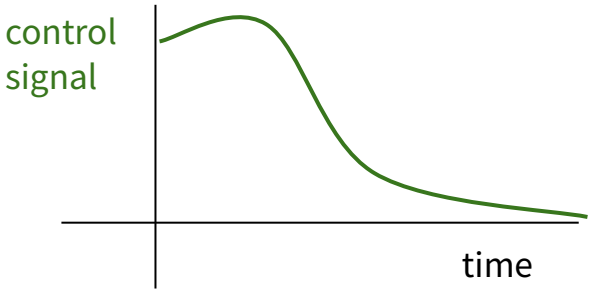




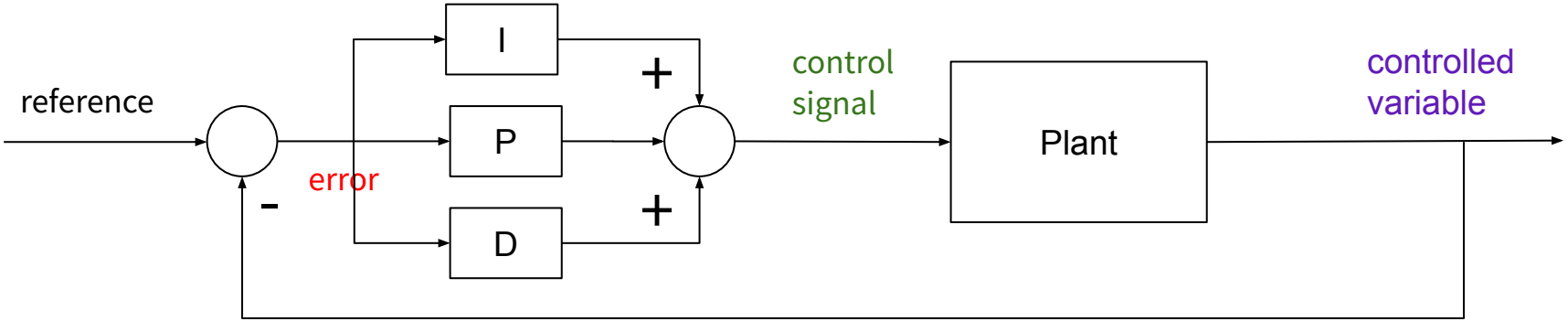
Integral Gain

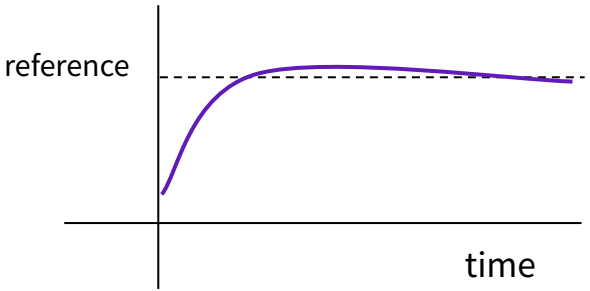


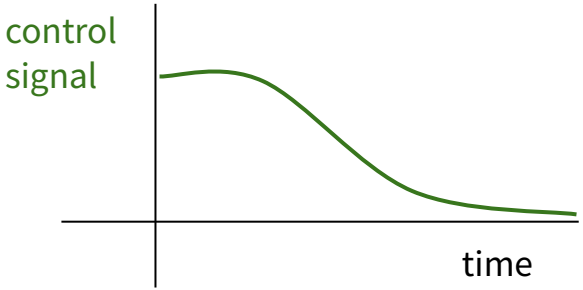




Derivative Controller

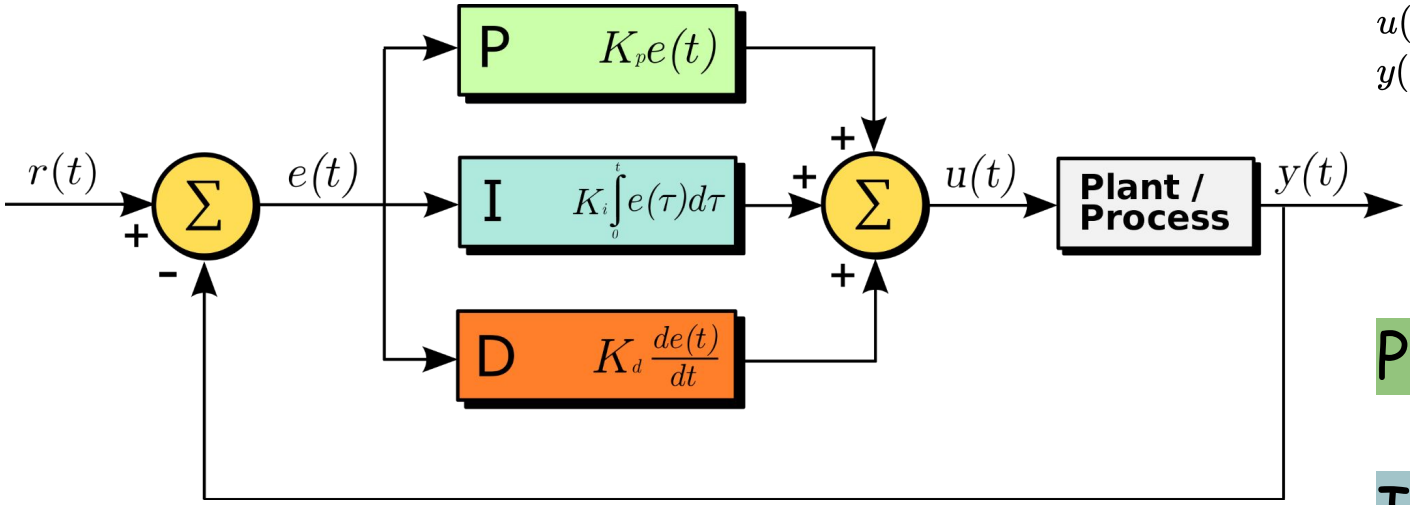






PID Controller

$r(t)$: *reference*
$e(t)$: *error*
$u(t)$: *control* signal
$y(t)$: *controlled variable*



$$u(t) = K_p e(t) + K_i \int_0^t e(\tau)d\tau + K_d \frac{de(t)}{dt}$$

P: present

I: past

D: future