

More on Digital Control Implementation

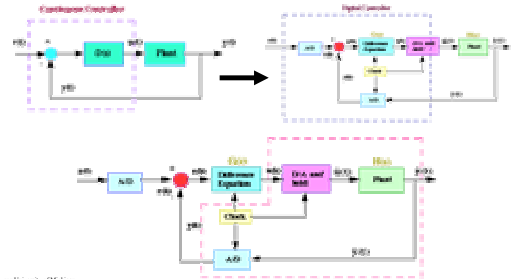
Lecture 5

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Digital Controllers



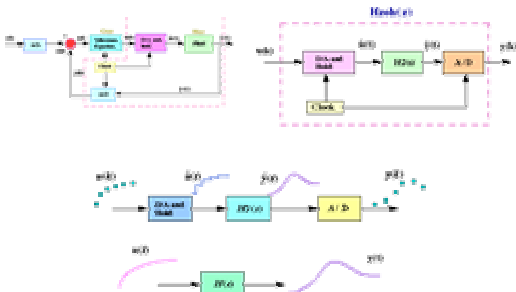
Source: University of Michigan
www.http://www.engin.umich.edu/group/ctrl/

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Digital Controllers – cont.

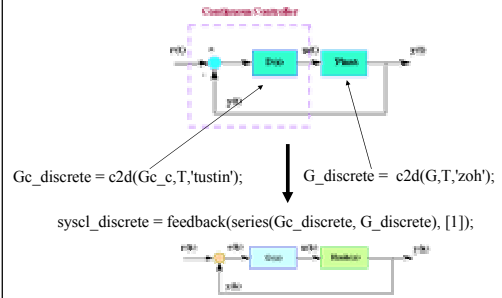


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Digital Controllers – cont.



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Hardware Gain

- Identification of the Hardware gain

$$k_{hw} = k_c k_a k_t k_{mp} k_e k_{ep} k_s$$

– where:

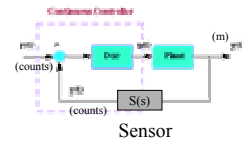
- k_c , the DAC gain, = 10V / 32,768 DAC counts
- k_a , the Servo Amp gain, = approx 2 (amp/V)
- k_t , the Servo Motor Torque constant = approx 0.1 (N-m/amp)
- k_{mp} , the Motor Pinion pitch radius inverse = 26.25 m-1
- k_e , the Encoder gain, = 16,000 pulses / 2π radians
- k_{ep} , the Encoder Pinion pitch radius inverse = 89 m-1
- k_s , the Controller Software gain, = 32 (controller counts / encoder or ref input counts)

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Hardware Gain



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