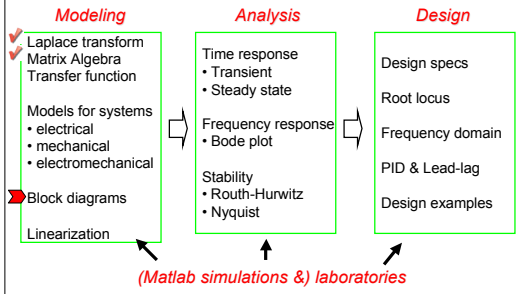
ME451: Control Systems

Lecture 3
Control Systems Introduction and Block diagrams

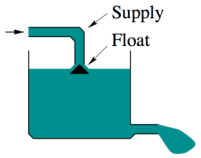
Prof. Clark Radcliffe, Prof. Jongeun Choi
Department of Mechanical Engineering
Michigan State University

Course roadmap



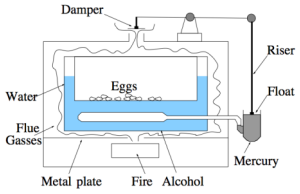
A Brief Control History

- B.C. Fluid Level/Flow Rate Control
  - Used by Greeks, Romans and before
  - Still used in modern toilets



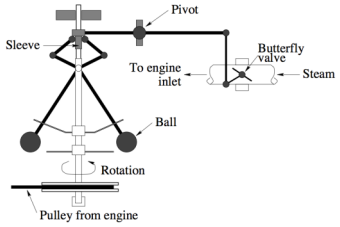
A Brief Control History

- 1624: Drebbel's incubator
  - Control temperature using mechanical feedback



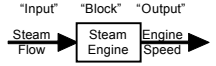
A Brief Control History

- 1788: James Watt's fly-ball governor
  - Mechanical feedback control of steam supply to an engine



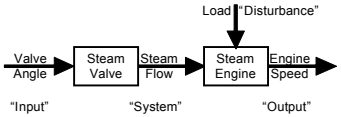
The Block Diagram

- Communication tool for Engineering Systems
  - Composed of Blocks with inputs and outputs



The Block Diagram

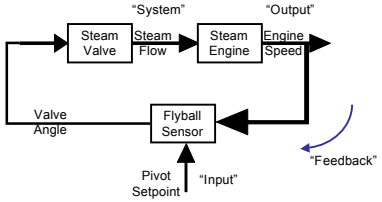
- Blocks Connect to form systems
  - Outputs of one block becomes input to another



7

The Block Diagram

- Blocks Connect to form systems
  - Outputs of one block becomes input to another



8

Summary and Exercises

- Block diagrams
  - Elementary diagrams
  - Feedback connections
- Next
  - Electrical Circuit Modeling

9

Exercises

Draw the block diagrams for

1. A home heating system
2. A residential toilet

Label all signal "arrows" and component "blocks"

The next homework is on the ME451 web site

.../me451/radcliff/ME451_Homework_2010_Spring.htm

10