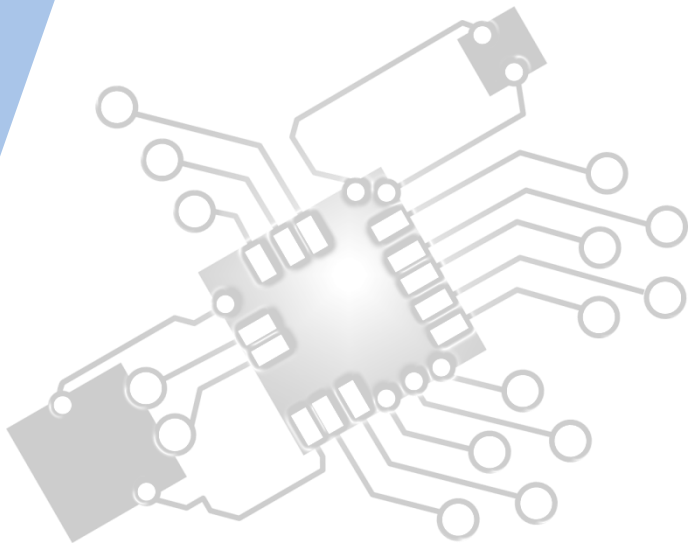
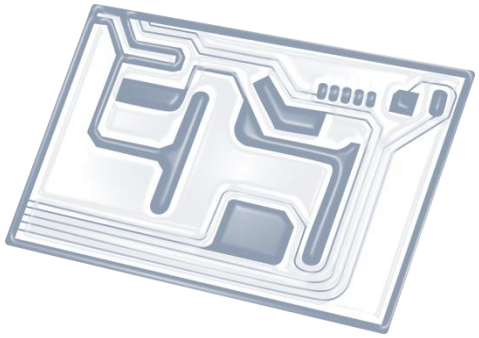
Control Systems

IB Computer Science



Content developed by
Dartford Grammar School
Computer Science Department

HL Topics 1-7, D1-4



1: System design

2: Computer Organisation

3: Networks

4: Computational thinking

5: Abstract data structures

6: Resource management

7: Control

D: OOP

HL only 7 Overview

Centralized control systems

7.1.1 Discuss a range of control systems

7.1.2 Outline the uses of microprocessors and sensor input in control systems

7.1.3 Evaluate different input devices for the collection of data in specified situations

7.1.4 Explain the relationship between a sensor, the processor and an output transducer

7.1.5 Describe the role of feedback in a control system

7.1.6 Discuss the social impacts and ethical considerations associated with the use of embedded systems

Distributed systems

7.1.7 Compare a centrally controlled system with a distributed system

7.1.8 Outline the role of autonomous agents acting within a larger system

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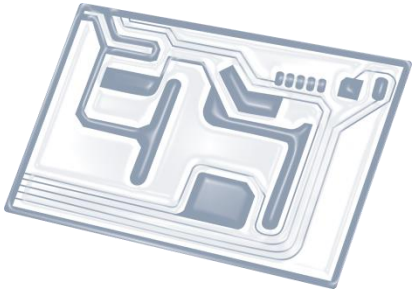
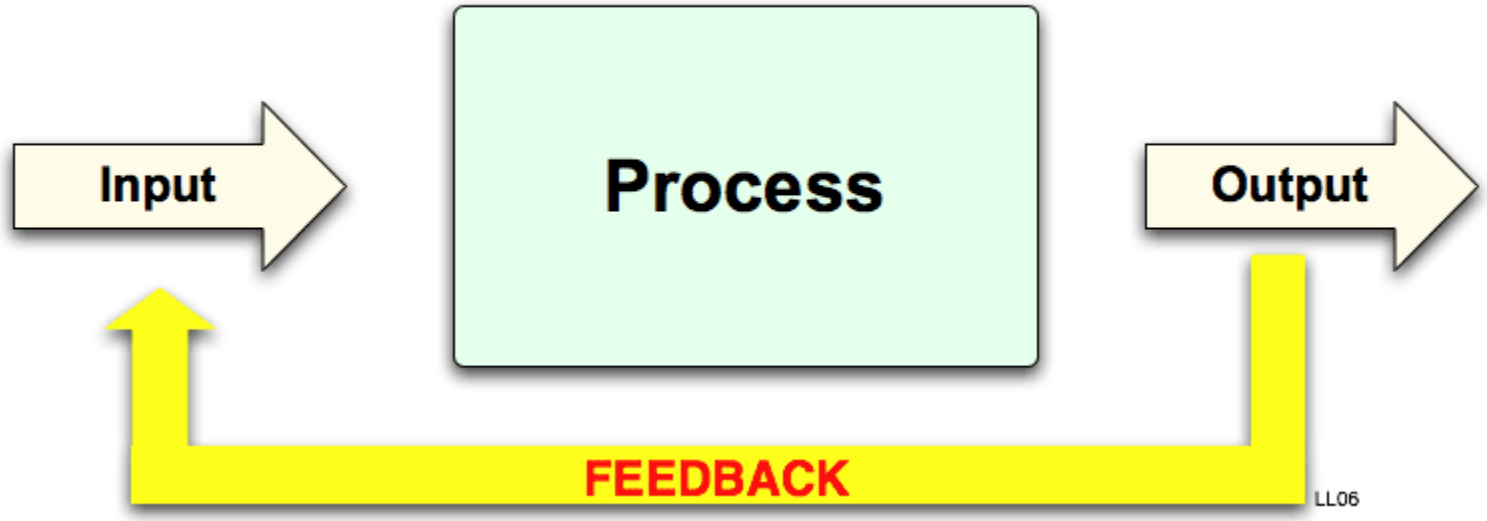


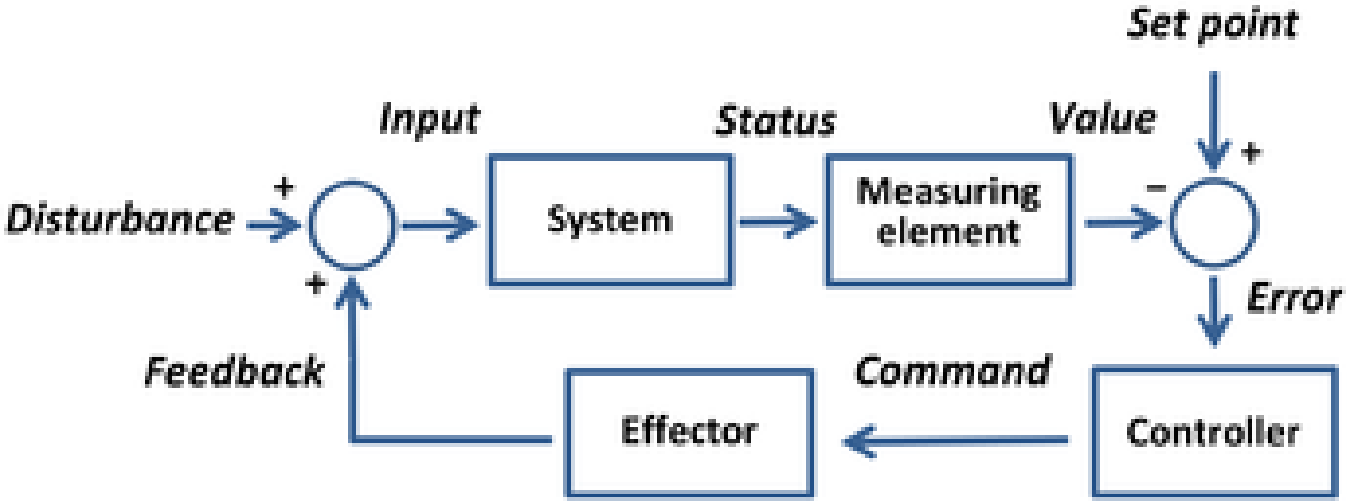
Topic 7.1.5

Describe the role of **feedback** in a control system

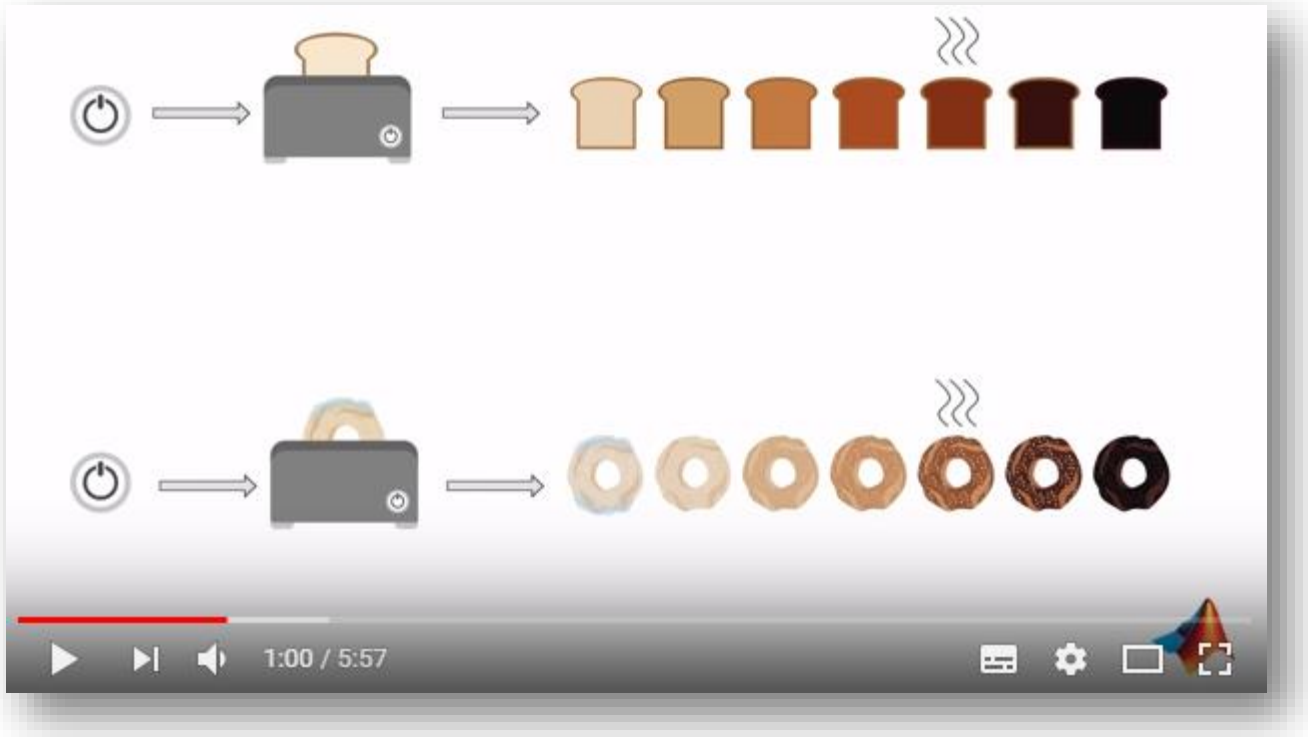


What is feedback?

It is the **modification** or **control** of a process or system by its **results** or **effects**, for example in a fridge the thermometer provides feedback to the sensor that switches the refrigeration system on/off.



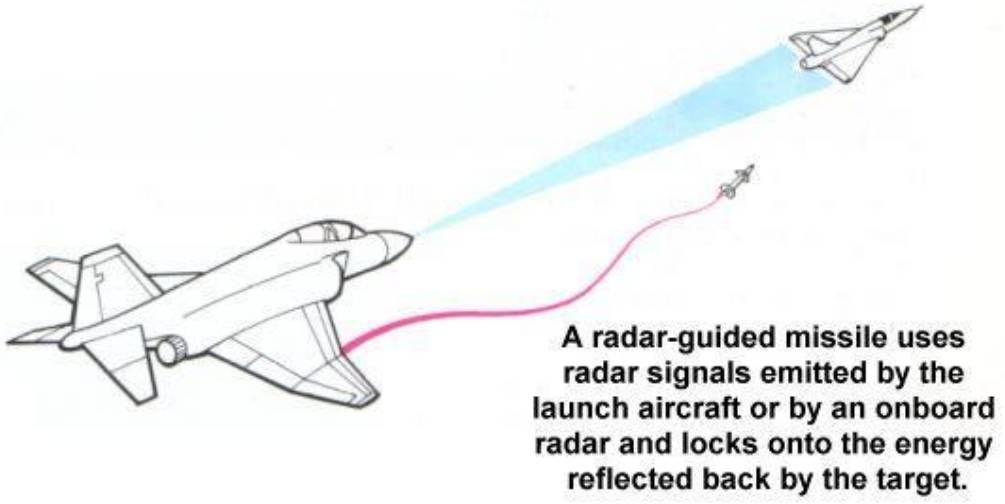
Video: Feedback Control Systems



Link (YouTube): https://youtu.be/5NVjIIi9fkY

Processes that use feedback

- A missile tracking a moving target
- A heating system in a house
- A life-support system on a spacecraft
- *… any situation that changes constantly that needs the system to react according to the new input*



Video: How do self-driving cars work

Link (YouTube): https://youtu.be/FCdYq3AhCFc