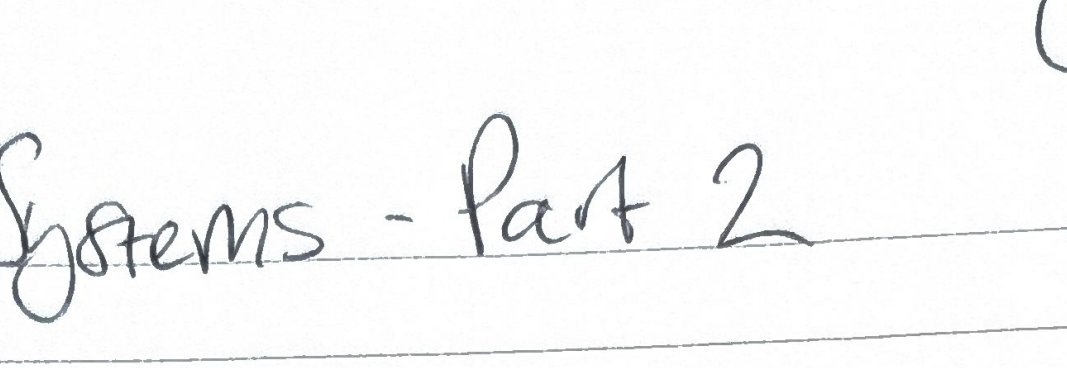
Week 2 Systems - Part 2

- Systems and their parameters
- Physical systems have parameters
- Why do we want to adapt a system?
- When do we want to adapt?
- How should we adjust the para?
  ↳ what algo to apply?

Circular causality

Closed loop system w/ agent & env

$\theta = \begin{bmatrix} \theta_1 \\ \theta_2 \\ \theta_3 \end{bmatrix}$ $x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$



There is some state equation which holds the behaviour of this system

How its internal state changes over time is a function of x itself ~~& your input~~

u = inputs to system

env has its own state eq too

Subsystems

- An element of a system is also a system = subsystem
- wider system is a **super system**

Overlapping Systems

- neuron groupings in brain which cross over

Open Systems

- Open systems can be open to: matter, energy, information
- To transmit info always includes energy
- earth = open system
- Open = in & out

Closed System

- open = norm for systems
- some say universe is only closed sys
- Some systems can be considered closed - partly when modeling
- e.g. closed based on time scale

Summary

1. Systems are comected sets of elements
unconnected elements are not systems

2. Subsystems - systems are made up of smaller systems

3. Supersystem - A systems env is also a system. Together =

4. Systems NOTM open bt can be modelled as closed
   - time scale
   - most elements closed