COMP310
Multi-Agent Systems

Session: 2017-2018

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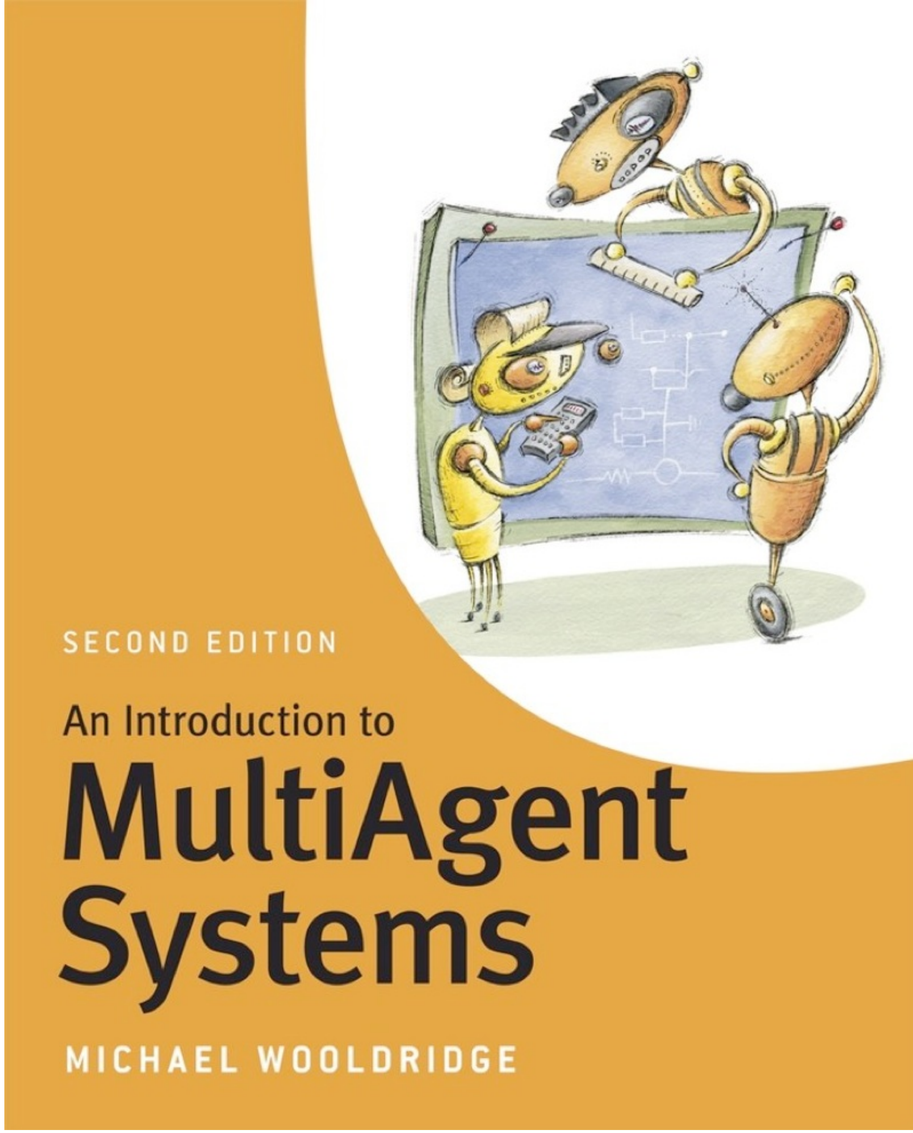
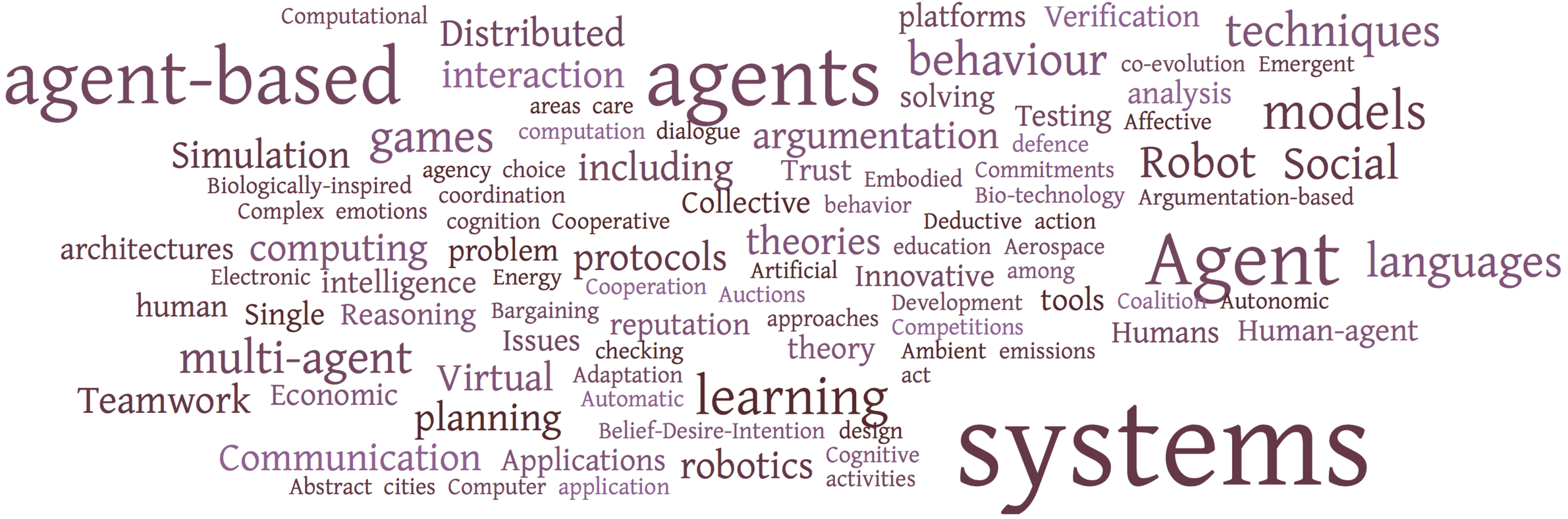
UNIVERSITY OF LIVERPOOL



What is it all about?



Bargaining & Negotiation

Auctions

Argumentation & Dialogue

Planning & Deliberation

Social Welfare (Voting)

Coalitions

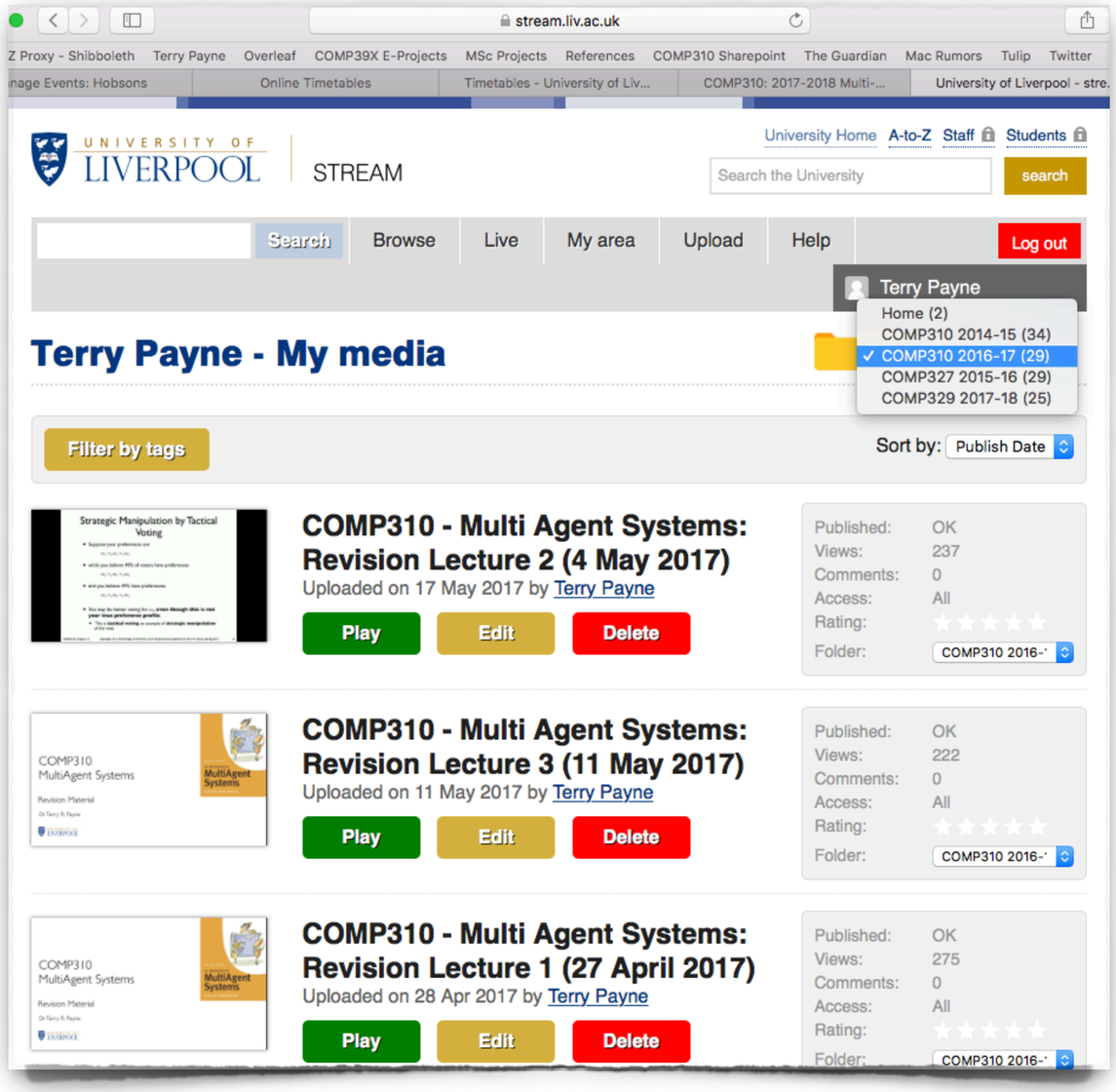
Rational Decision Making

General Admin

- Lecturer: Dr Terry Payne
  - Ashton Building
  - Email: T.R.Payne@liverpool.ac.uk
    - Surgery: Mon/Wed/Thur (email for appointment)
- Course Notes
  - Available from the web site as pdfs
    - Lectures will be screen cast and available from the web sites
- Web Site and Resources
  - General information
    - http://www.csc.liv.ac.uk/people/trp/COMP310.html

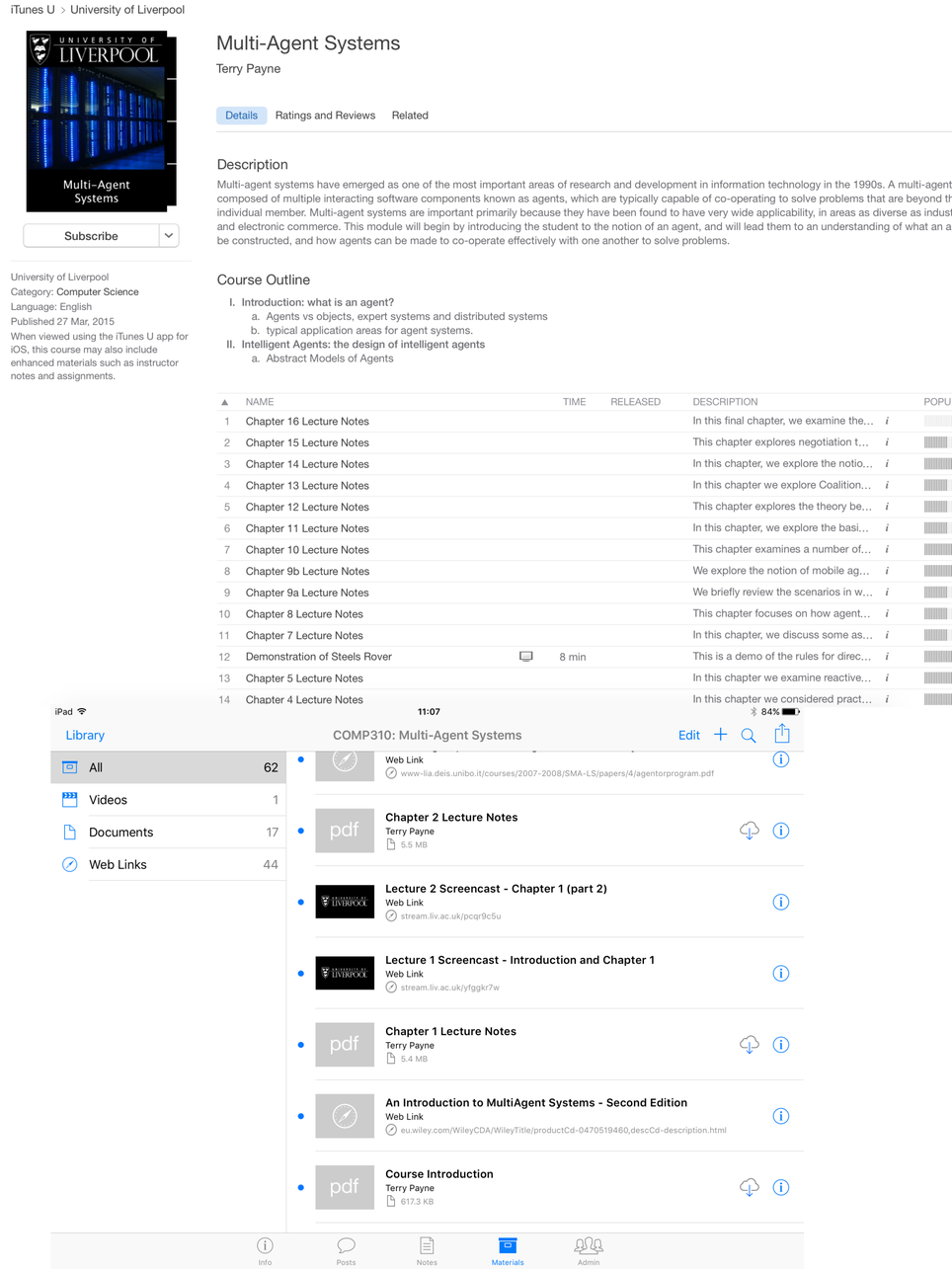
Module Delivery

- 3 Lectures per week
  - Lectures will be captured and uploaded to the stream site
    - Lectures from previous years have been lecture captured and available from the web site
    - Attendance is still expected!!
- No Lab Classes or Assignments
  - Revision Exercises will be made available
- The module will be 100% Exam



iTunesU

- The module was previously made available from iTunesU
  - Slides are available from iTunes
  - There may be some revisions in the current slides.
- Full materials available from the iTunesU application on iOS.
  - Links to papers
  - Lecture notes
  - Links to Screen Casts



Main Taught Material

- Introduction
  - what is an agent?
  - agents and objects
  - agents and expert systems
  - agents and distributed systems
  - typical application areas for agent systems

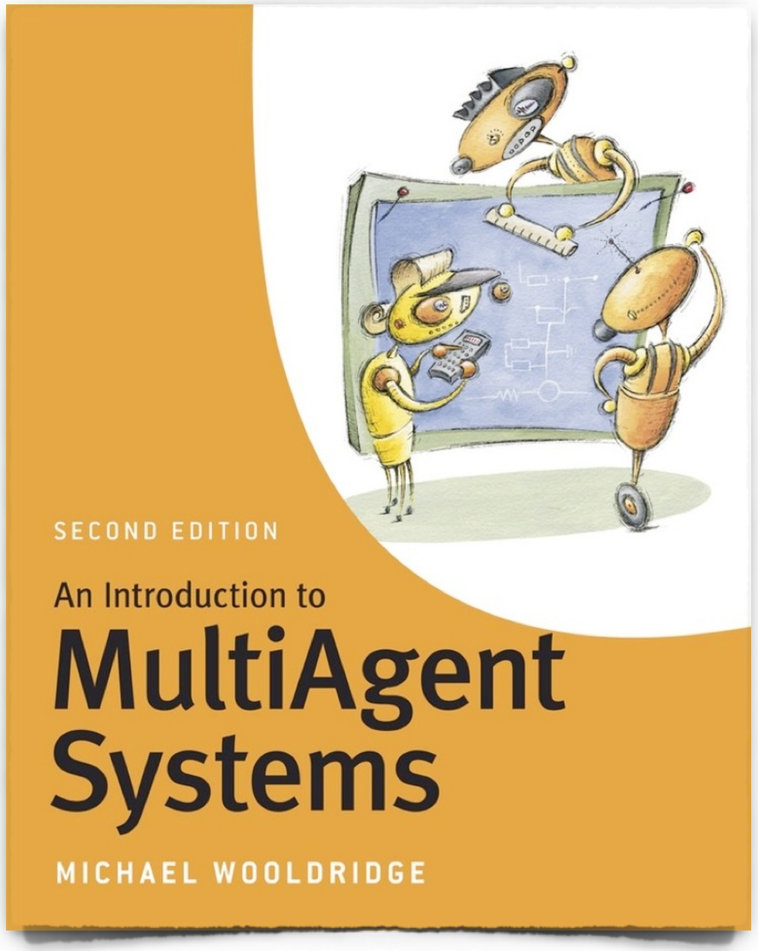
- Intelligent Agents
  - the design of intelligent agents - reasoning agents
  - agents as reactive systems
  - hybrid agents
  - layered agents

- MultiAgent Systems
  - classifying multi-agent interactions - cooperative versus non-cooperative
  - zero-sum and other interactions
  - what is cooperation?
  - how cooperation occurs - the Prisoner's dilemma and Axelrod's experiments
  - interactions between self-interested agents:
  - auctions & voting systems; negotiation
  - Interactions between benevolent agents: cooperative distributed problem solving
  - coherence and coordination
  - argumentation, legal reasoning, dialogues

Course Text

- The module is based on Michael Wooldridge's book:
  - An Introduction to MultiAgentSystems
    - Wiley 2009
    - http://www.cs.ox.ac.uk/people/michael.wooldridge/pubs/imas/IMAS2e.html

- The material has also been revised and updated over the last few years
  - Thanks go to both Mike (who used to teach this course) and additional material by Simon Parsons.



Module Aims

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  1. To introduce the student to the concept of an agent and multi-agent systems, and the main applications for which they are appropriate;
  2. To introduce the main issues surrounding the design of intelligent agents;
  3. To introduce the main issues surrounding the design of a multi-agent society;
  4. To introduce a contemporary platform for implementing agents and multi-agent systems.

Module Objectives

- At the end of the module, the student will be able to demonstrate:
  1. Understand the notion of an agent, how agents are distinct from other software paradigms (eg objects) and understand the characteristics of applications that lend themselves to an agent-oriented solution;
  2. Understand the key issues associated with constructing agents capable of intelligent autonomous action, and the main approaches taken to developing such agents;
  3. Understand the key issues in designing societies of agents that can effectively cooperate in order to solve problems, including an understanding of the key types of multi-agent interactions possible in such systems;
  4. Understand the main application areas of agent-based solutions, and be able to develop a meaningful agent-based system using a contemporary agent development platform.

Finally

- The obvious...
  - Switch off all mobile phones during lectures
  - Do not sign the register on behalf of others
  - Attend lectures and attempt the exercises set - this will help you do the continuous assessments
  - Ask questions if there is anything that you do not understand

- And respect your fellow students...
  - There are people here who want to learn!
  - If you want to talk or mess around, then fine...
  - ...BUT do it somewhere else!