

COMP310 – Multi Agent Systems

Lecture 1:

Welcome to the Module!

Lecturer: Dr. T. Carroll

Email: Thomas.Carroll2@Liverpool.ac.uk

Office: G.14

See Vital for all material

Overview

- Module Staff
- Syllabus Breakdown
- Assessment
- Module Delivery
- What's this Multi Agents Systems stuff all about?
- Short Demonstration

The Boring
(but *Important*)
Bits....

Module Staff

- Thomas Carroll - Lecturer
- Joshua Alcock - Tutor
- Peter Stringer - Tutor

Module Delivery

- COMP310 delivery will be **different** from most other modules
- We have 3 lectures timetabled per week, but **will not use all of them**
- We will use a **flipped classroom** approach with **blended learning**:
 - **1 lecture** per week to introduce the material
 - **Weekly short videos, reading, and quizzes** to do in **your own time** (via vital)
 - **1 “tutorial-lecture” per week** to do exercises, group work and answer questions

Tell me more!

- Short videos will be the **main method** of content delivery
 - Can be watched at your own pace for making notes
 - Can be watched at your own time
 - You can pause, rewind, rewatch as many times as you like
 - They are short – so they do not (should not) get boring!
- A new set available each week
 - watch them each week
 - confirm them as reviewed
 - complete the accompanying quiz
 - Do the reading
- There are also “Achievements” available on vital throughout the module

General Weekly Plan

- **Saturday – Thursday:** You watch the videos, do quizzes, and you **learn** the material]
- **Tuesday, 1000-1100, ELEC-ELT: NOT USED** (unless I inform you by vital/email)
- **Thursday, 1500-1600, CHAD-TOWER-MUSP-LT: “Tutorial” session** for more in-depth exercises, cementing our knowledge of the week’s materials
- **Friday, 1300-1400, CHAD-TOWER-MUSP-LT: Lecture** to introduce *next week’s* material

Assessment

- No Labs
- No Assignments
- 100% Exam

Recommended Text Book

- An Introduction to Multi Agent Systems
Michael Wooldridge (Wiley, 2009)
 - 1st and 2nd edition available as paper back in library
 - 1st edition available as **free ebook** via the library

Syllabus Breakdown

- What is an Agent?
- What are the applications of agents?
- Intelligent Agents
 - Design
 - Theoretical and Practical Reasoning
 - Deliberation, Commitment
- Agent Languages
- Multi Agent Systems
 - Communication and Speech Acts
 - Coordination, Collaboration
 - Cooperative/non-cooperative interactions
 - Interactions between self-interested agents
 - Social Choice
 - Voting Games
 - Coalition Theory
 - Auctions
 - Negotiation
 - Argumentation and Dialogues

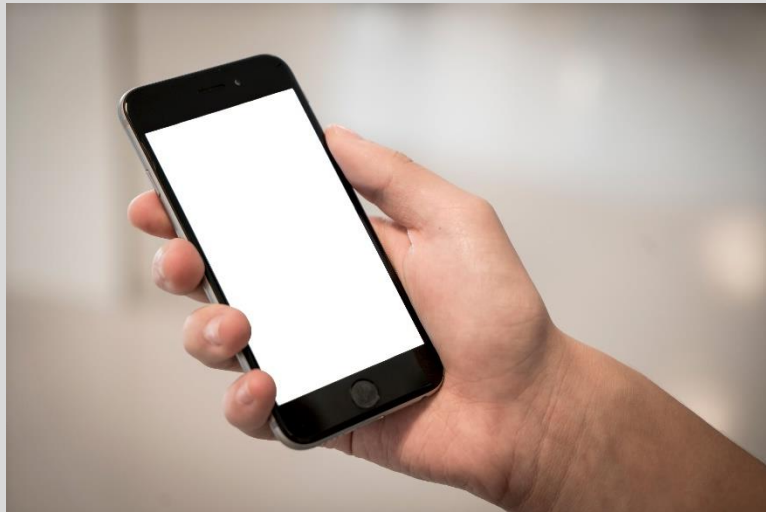
***“In the beginning,
there was light...”***

Where Did This All Come From?

- Scientific discoveries / scientific fields don't **just appear**
- They come from natural progression of existing fields of study
- **5 Computing Trends** lead us in to the world of Multi Agent Systems:
 1. Ubiquity
 2. Interconnection
 3. Intelligence
 4. Delegation
 5. Human Orientation

Ubiquity – It's Everywhere!

- **Moore's Law:** The cost of computing power constantly *reduces*
- Processing power can be introduced where was previously thought uneconomical
- As computing capability spreads, It becomes **ubiquitous**



Interconnection

- Computers do not stand alone
- Increasingly, services, apps, devices are **talking** to each other, or **connecting** to other servers
- **The Internet** is a prime example
- **Internet of Things** is becoming more prevalent
- **Distributed and Concurrent Systems** are now the norm

Intelligence

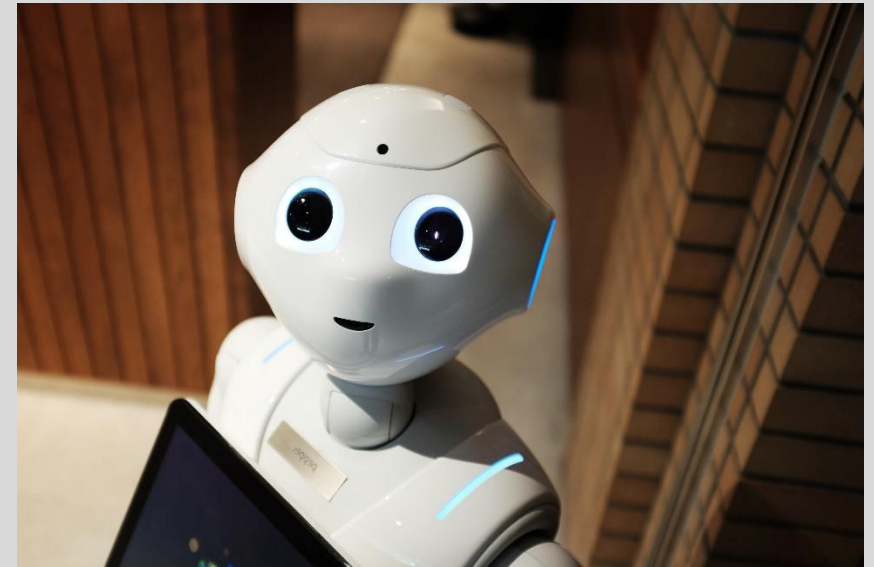
- **NOT** talking about **Artificial Intelligence**
- We can use computers to solve tasks that are **increasingly complex**
- These complex problems take *a good deal of intelligence* to be able to solve

Delegation

- We now trust **more aspects of our life** to computers, without our intervention
- Eg:
 - Fly-by-wire aeroplanes
 - Self-driving cars
 - Manufacturing
 - Automated Homes

Human Orientation of Computing

- The **abstractions** that we use to relate to machinery are constantly changing....
 - Machine Code
 - Assembly
 - Machine independent languages
 - Subroutines
 - Procedures / Functions
 - Abstract Data Types
 - Objects
 - ???
 - Agents
- Each “level-up” brings an *efficiency gain*



**Important
Demonstration**
(This recording will be on Vital
shortly after the lecture)

How to Use COMP310 on Vital

- Review Lectures in “Learning Resources”
- Blended Learning Content in “Learning Resources”
 1. Watch a video
 2. Mark as “Reviewed”
 3. Answer Quizzes
- Look out for “Achievements” in the “Achievements” section

This Week's Outlook

Week 1 Plan

- Timetable:
 - Tuesday 28th January (today) (ELEC-ELT) – Introductory Lecture
 - **Thursday 30th January – NO SESSION THIS WEEK**
 - Friday 31st January – Lecture
- Your Tasks to do before Friday:
 - Watch, make notes, learn from... this week's Blended Learning Videos (I will release these later today)
 - Mark them as “reviewed”
 - Have a go at the quizzes