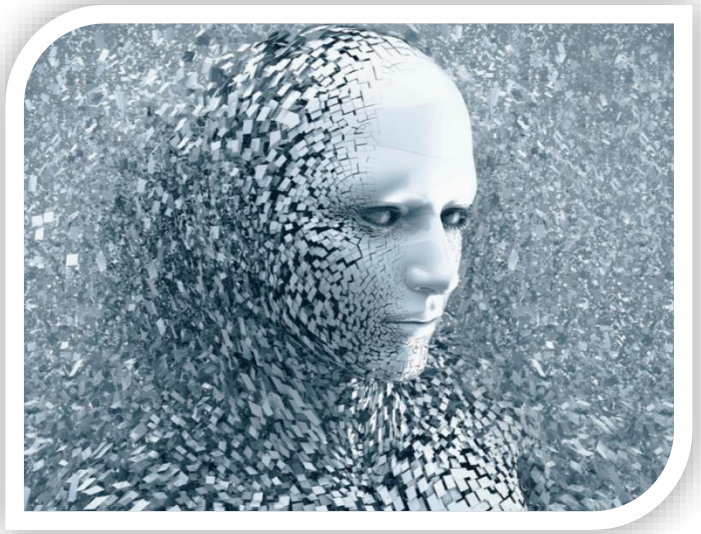
UNIVERSITY OF WEST LONDON



Artificial Intelligence

Session 1: Introduction

School of Computing and Engineering
University of West London, UK

Dr Massoud Zolgharni

Overview

- Important points from the Module Study Guide (MSG)
- A glance at the assessment items
- A look at the planned sessions
- An Introduction to Artificial Intelligence (AI)

Module Leader/Lecturer

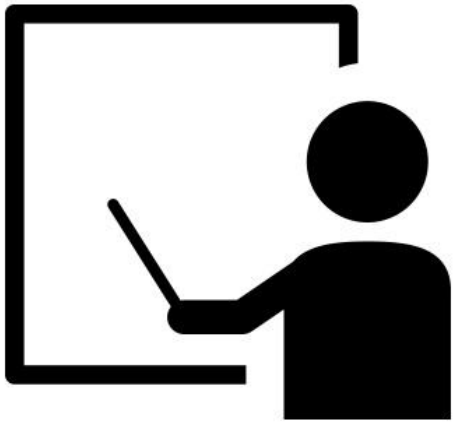
- Dr Massoud Zolgharni
- My expertise: Computer Vision, Image Processing, Machine Learning, Medical Imaging
- E-mail: Massoud.Zolgharni@uwl.ac.uk
- Phone: 020 8231 2731
- Office hours: Wednesday, 2-3pm, BY.03.032
  or by appointment (just e-mail or phone me)

Tutors for practical sessions:

Dr Massoud Zolgharni

Dr Nasser Matoorian

Module structure



Lecture

- Theoretical aspects of AI
- Lecture notes will be uploaded
- Group-1: Wednesday, 10:00-11:00, BY0.03.031
- Group-2: Wednesday, 11:00-12:00, BY0.03.031

Seminar (Practical Workshop)

- Tutorials & Assignment
- 120 minutes /week
- Group-1: Wednesday, 12:00-14:00, BY0.03.031
- Group-2: Wednesday, 12:00-14:00, BY0.03.022

Contact e-mail

Consider to auto-forward your student e-mail:

Consider auto-forwarding your student e-mail
213xxx123@student.uwl.ac.uk to your **personal e-mail account**.

www.uws.ac.uk/current-students/it-printing/email-access-office-365-tools

This will make sure you won't miss any e-mails from:
The University
Your teachers
Your personal tutor

However, please use your student e-mail to reply to us.

Assessment

Assessment Item 1

- Logbook assignment, 50%
- Submission due-date: week 12
- PDF submission via Turnitin

Assessment Item 2

- Exam, 50%
- Paper-based on theory
- During the exam week

Threshold of 30% for each assessment item
You must achieve an overall mark of at least 40% to pass the module.

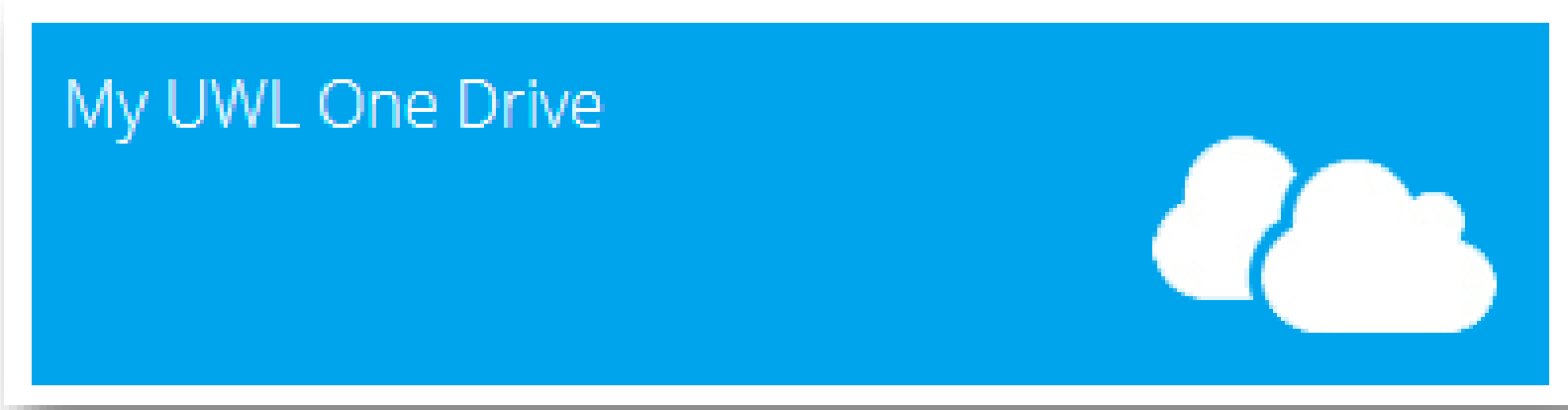
Storing material in your cloud storage

We will start working on your assignments in the practical sessions.

From the practical sessions, please save your work on your UWL cloud storage, so you can add it to your final report later.

Your cloud storage:

1) Go to your student portal
2) Click on My UWL One Drive



Avoiding Plagiarism

Helping each other with labs is great! But…

Do not plagiarise !!!

Plagiarism: Copying from another student/team or allowing someone to copy your work, getting someone else to do your work

Copying from Web, book etc. without clear and explicit acknowledgement

Refer to Student Handbook Section 3. University Regulations and Student

http://www.uwl.ac.uk/students/current_students/Advice_to_students_on_plagiarism.jsp

Please don't put yourself or your friends at risk!

Communication

Login regularly on Blackboard and check for any news items about things like: cancellation, change of room, time etc.

Consider auto-forwarding your student e-mail to your personal e-mail account (however, please use your student e-mail to reply to us)

Check your e-mail regularly.

E-mail me if you have questions.

If you have module related problems let me know asap– don't wait until the end of the semester!

Personal tutors: All of you have an individual tutor, please contact her/him asap if there are any problems that hinder you from making the most from your studies.

How to succeed in this module?

Use the practical sessions to work on your assignments.

This course is not about memorising facts but it is about the understanding and application of techniques and methods in AI.

So it is essential to attend all lectures and work through the practical exercises each week.

It is also necessary to participate in the practical sessions where you can exercise your newly learned skills.

How to succeed in this module?

Attendance

- All lectures and lab sessions have to be attended
- If you miss a class try to catch up (Lectures notes a good place to start)
- Check the notes on BB, ask your friends
- Register your attendance/ “Touch in” with your ID card

Be considerate to others in the lecture / practical sessions

To do well you'll need work outside the four timetabled hours each week.

Golden rule: *“For each taught hour you should put another 2 hours of your own studies.”*

How to succeed in this module?

SAM: Students Attendance Monitoring

You are required to swipe in at every session if you don't do you will be noted as "absent" for this session.

Please keep in mind:

- Swipe in with your card, not your entire wallet (take your card out of your wallet)
- "Thank you" doesn't necessarily mean you swiped in correct
- Don't type in your student number, this will not register you for the session
- Don't sign in for friends (you are not doing them a favour)
- If you have consecutive sessions, swipe in at the beginning of each session

Schedule of the Module

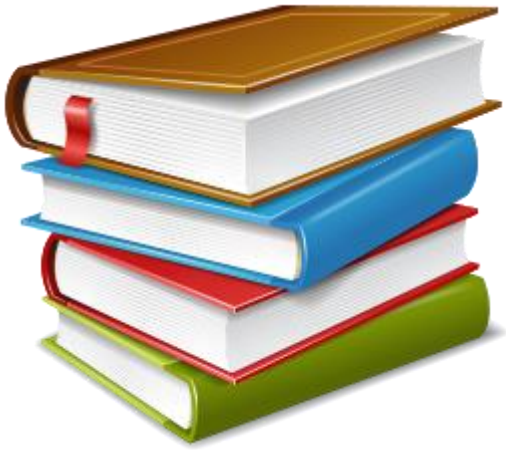
There is a session schedule available online on Black Board as part of MSG.

Programme content	Introduction to the module
Key concepts / issues	Module Study Guide Assignments Aims and goals of the module
Learning and teaching	Lecture/ Practical
Pre session reading	Module Study Guide
Literature for this session	Content on Blackboard
Independent study	Literature acquisition

Last lecture: Machine Learning and Deep Learning?!

Literature

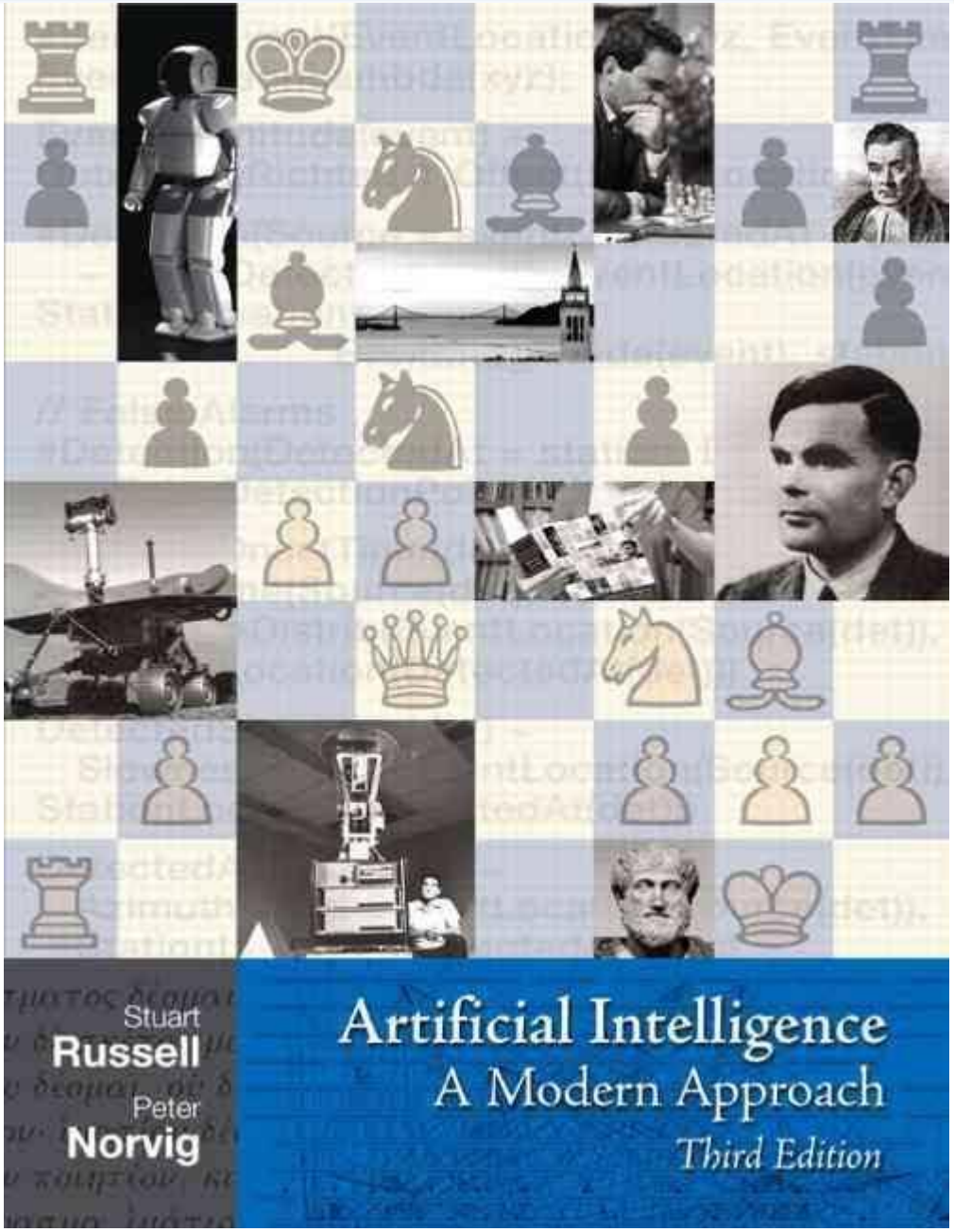
You can also login to the Student Portal and select My Blackboard to see an online version of the reading list shown below for your module maintained by Library Services. This shows real-time availability of books in our library catalogue and direct links to recommended online resources to save your time. Special online support guides (LibGuides) for the subject are also available to help you find relevant information for assignments, with contact details of the Academic Support Librarian for your subject.

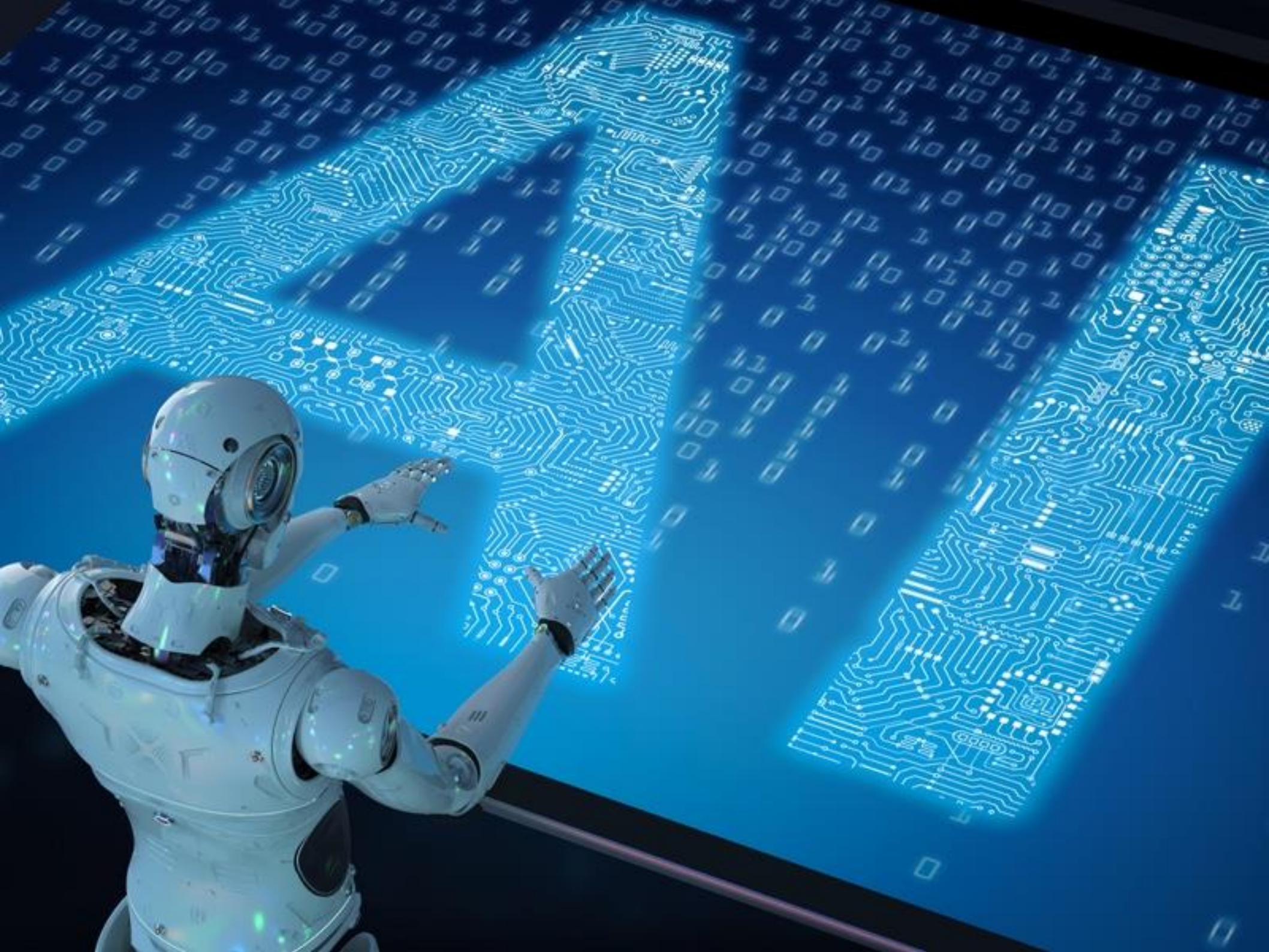


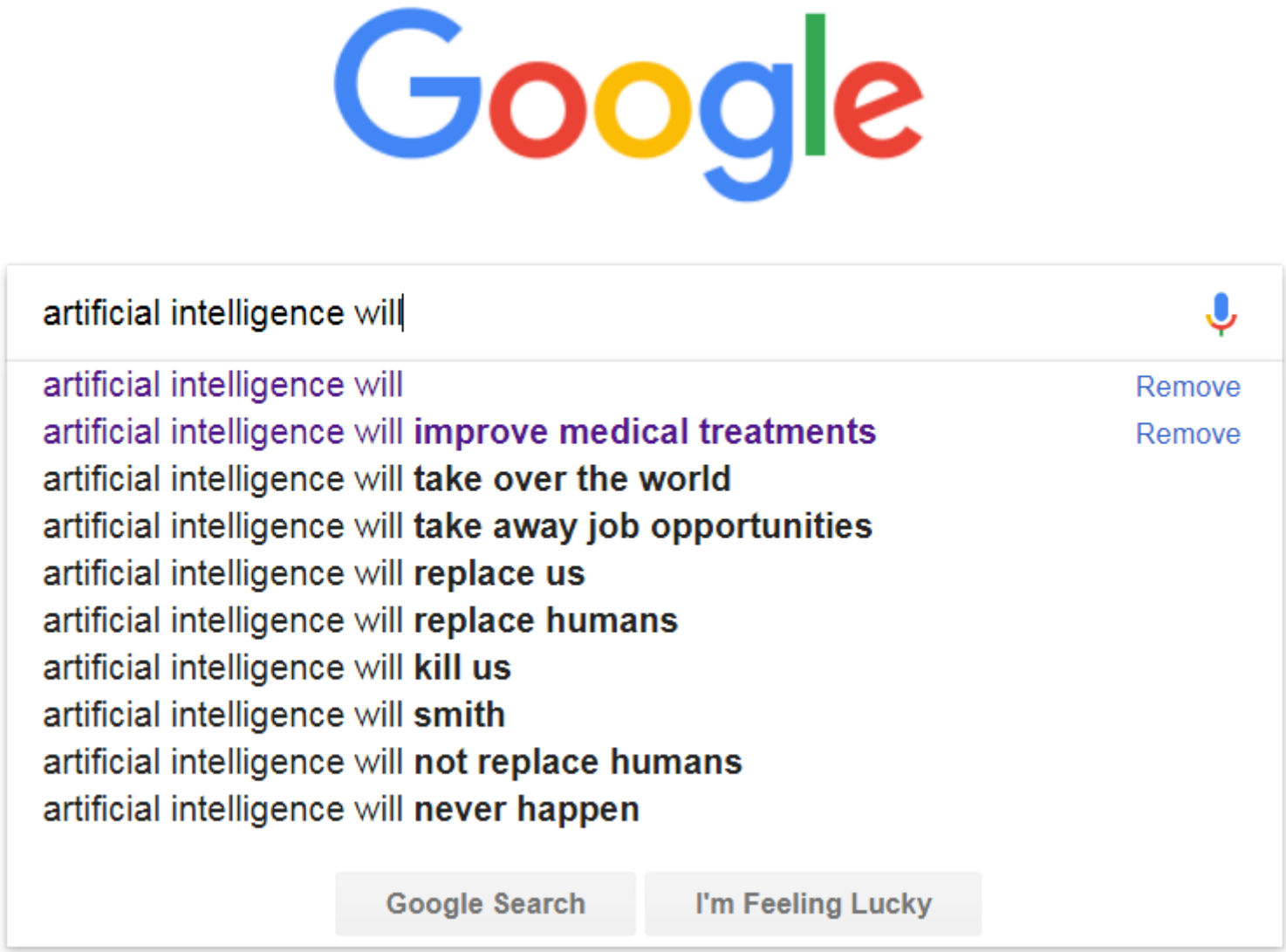
Textbook

The lecture and the module are based on this (seminal) book:

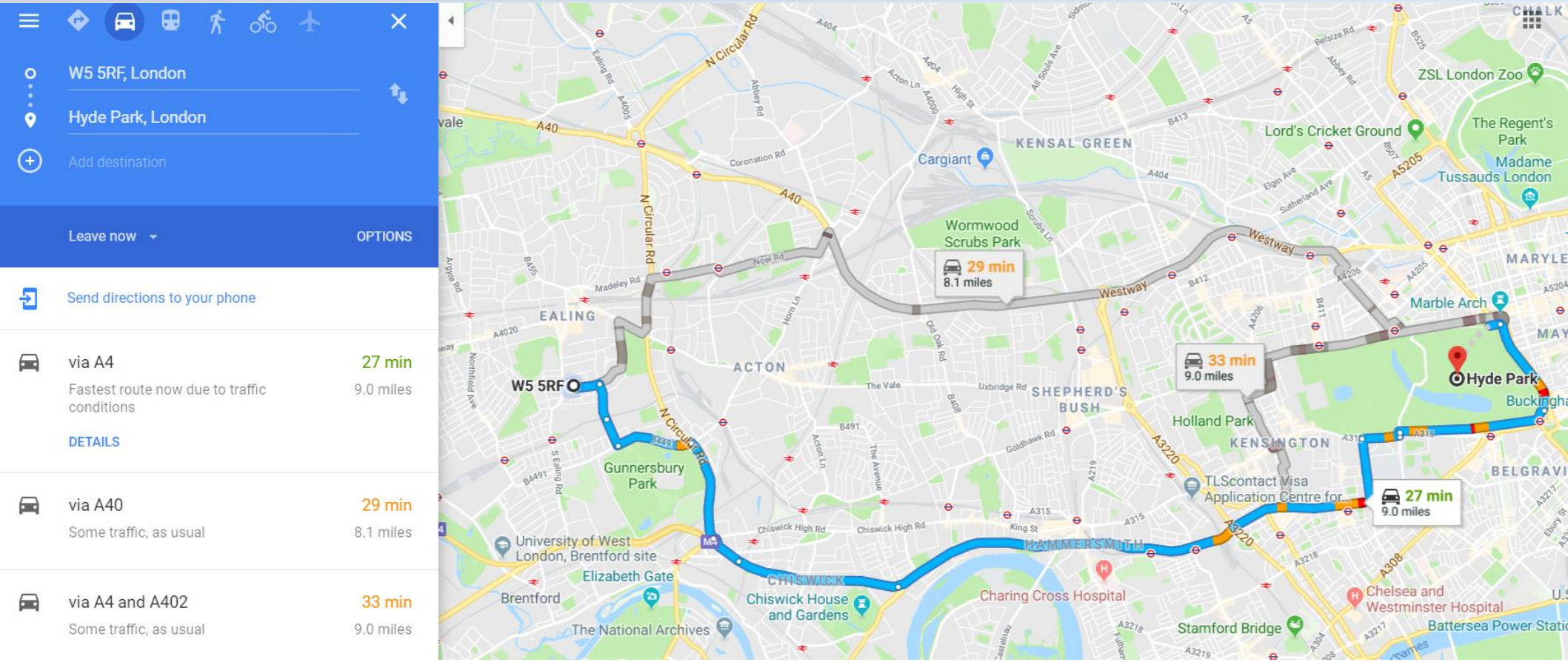
Stuart Russell, Peter Norvig: ***Artificial Intelligence A Modern Approach***
Third Edition, Pearson; 3 edition (18 May 2016)
ISBN-10: 1292153962
ISBN-13: 978-1292153964






Google
artificial intelligence will
artificial intelligence will
Remove
artificial intelligence will improve medical treatments
Remove
artificial intelligence will take over the world
artificial intelligence will take away job opportunities
artificial intelligence will replace us
artificial intelligence will replace humans
artificial intelligence will kill us
artificial intelligence will smith
artificial intelligence will not replace humans
artificial intelligence will never happen
Google Search
I'm Feeling Lucky

AI Lecture 1: Module overview and introduction to sessions



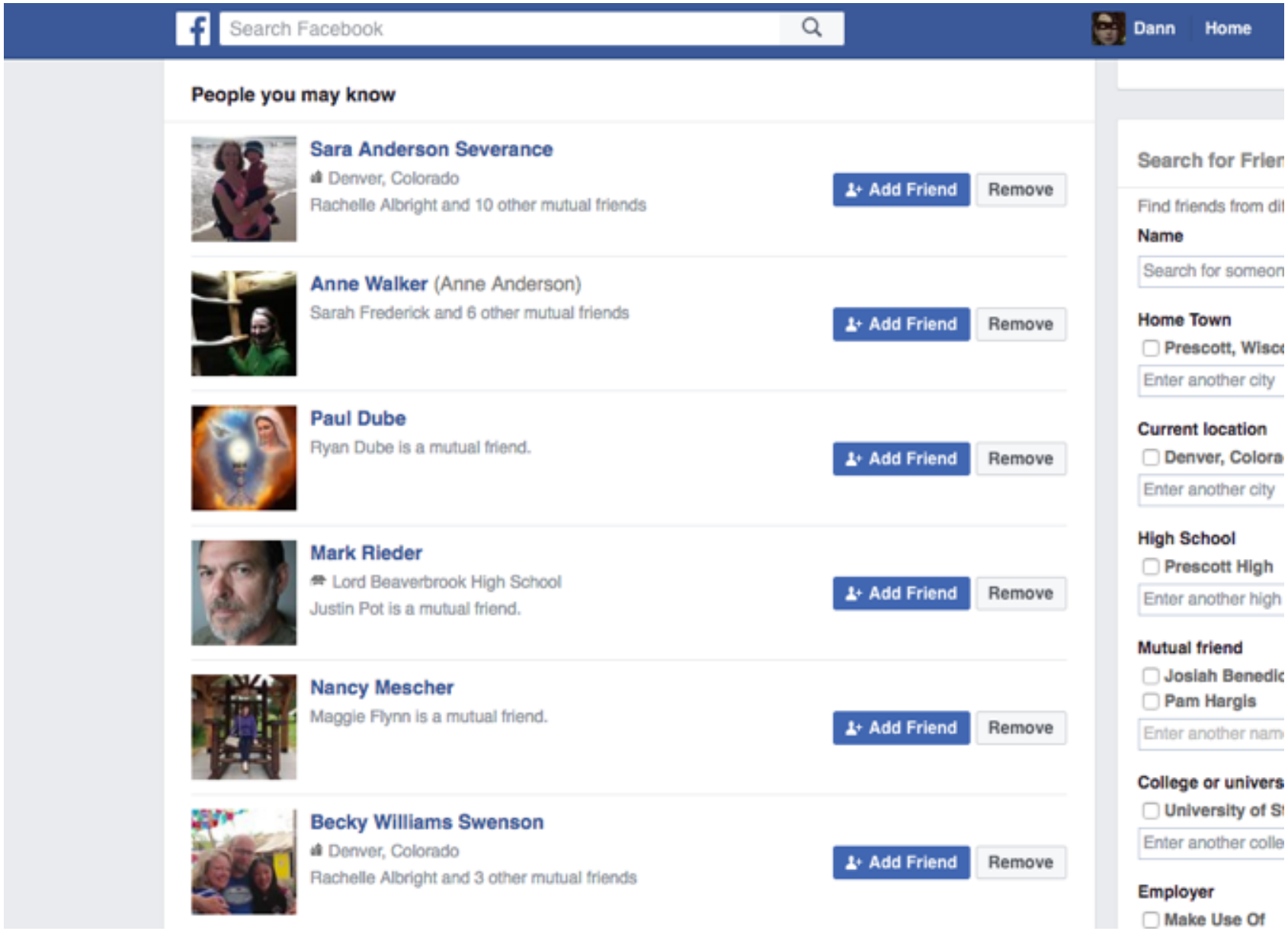
Going from UWL to Hyde Park:

- at least 10 junctions
- assume each junction has 3 options
- there are 3^10=59049 possible options!
- How do we do it?
- How do Google, TomTom, etc. do it?

Is navigation AI?

- official speed limits and recommended speeds
- likely speeds derived from road types
- historical average speed data over certain time periods
- actual travel times from previous users
- real-time traffic information
- etc

Is this AI?

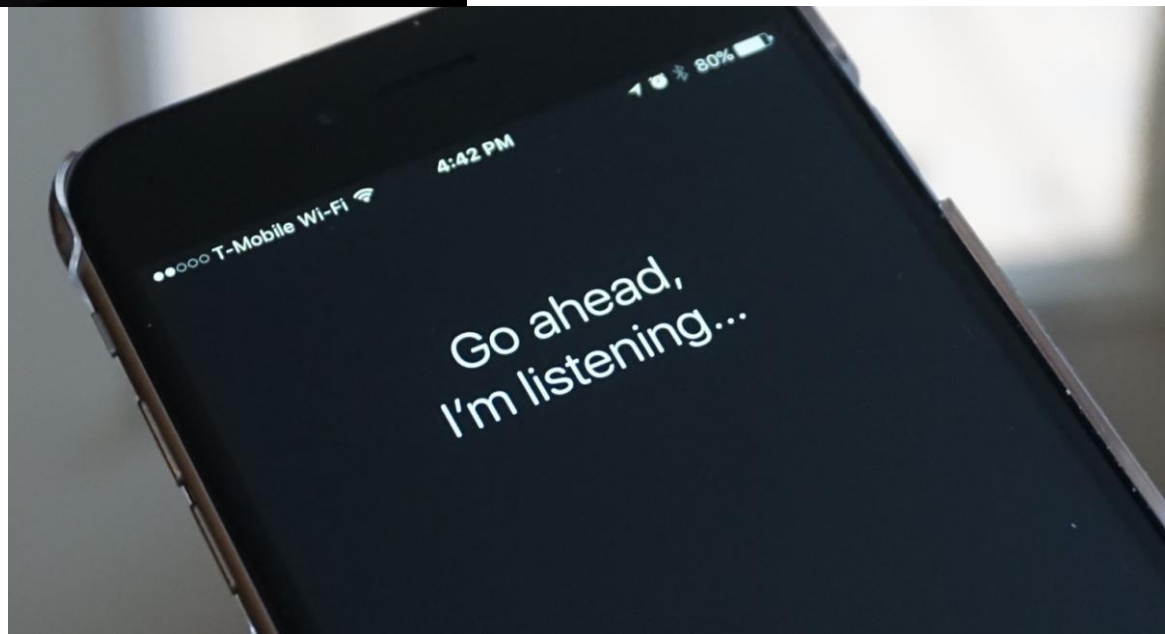

Search Facebook
Dann
Home
People you may know
Sara Anderson Severance
Denver, Colorado
Rachelle Albright and 10 other mutual friends
Add Friend
Remove
Anne Walker (Anne Anderson)
Sarah Frederick and 6 other mutual friends
Add Friend
Remove
Paul Dube
Ryan Dube is a mutual friend.
Add Friend
Remove
Mark Rieder
Lord Beaverbrook High School
Justin Pot is a mutual friend.
Add Friend
Remove
Nancy Mescher
Maggie Flynn is a mutual friend.
Add Friend
Remove
Becky Williams Swenson
Denver, Colorado
Rachelle Albright and 3 other mutual friends
Add Friend
Remove
Search for Frien
Find friends from di
Name
Search for someon
Home Town
Prescott, Wisc
Enter another city
Current location
Denver, Colora
Enter another city
High School
Prescott High
Enter another high
Mutual friend
Josiah Benedic
Pam Hargis
Enter another nam
College or univers
University of S
Enter another colle
Employer
Make Use Of

Is this AI?


amazon.com
125 new
2 used from $62.09
Frequently Bought Together
Price for both: $78.97
Add both to Cart
Add both to Wish List
Show availability and shipping details
This item: Transcend 1 TB USB 3.0 External Hard Drive - Military Drop Standards (TS1TSJ25M3) $68.99
Case Logic PHDC-1 Compact Portable Hard Drive Case (Black) $9.98
Customers Who Bought This Item Also Bought
Case Logic PHDC-1 Compact Portable Hard Drive Case (Black)
(1,210)
$9.98 Prime
ORICO PHD-25 -GN 2.5 " 640 GB Portable External Hard Drive Case , Camera Bag , EVA ...
(44)
$9.99 Prime
AmazonBasics External Hard Drive Case
(2,113)
$6.99 Prime
Rescue +Replace
Seagate 2-Year Rescue & Replace Plan
(55)
$29.99
Customers viewing this page may be interested in these sponsored links (What's this?)

Is this AI?

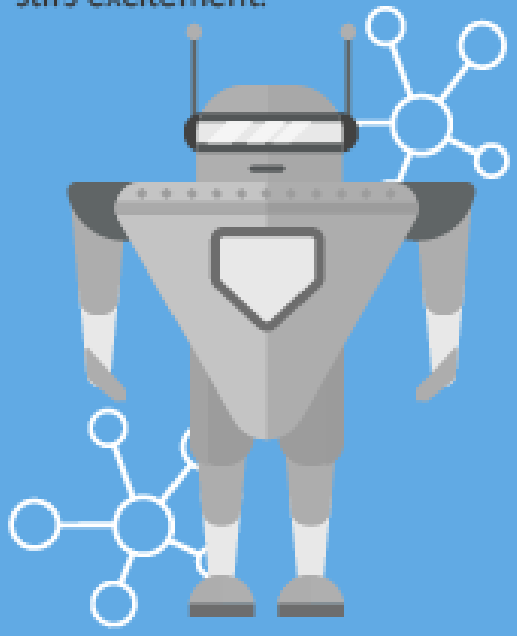

Phone
Mail
What can I help you with?


T-Mobile Wi-Fi
4:42 PM
80%
Go ahead,
I'm listening...

AI - Machine Learning - Deep Learning

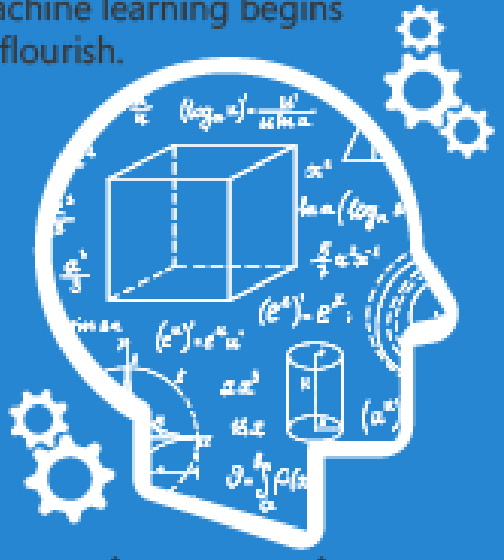
ARTIFICIAL INTELLIGENCE

Early artificial intelligence stirs excitement.



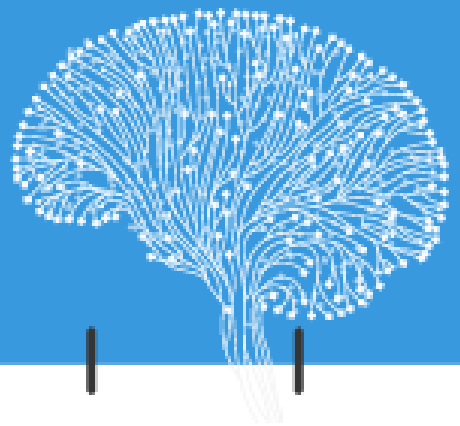
MACHINE LEARNING

Machine learning begins to flourish.



DEEP LEARNING

Deep learning breakthroughs drive AI boom.



1950's 1960's 1970's 1980's 1990's 2000's 2010's

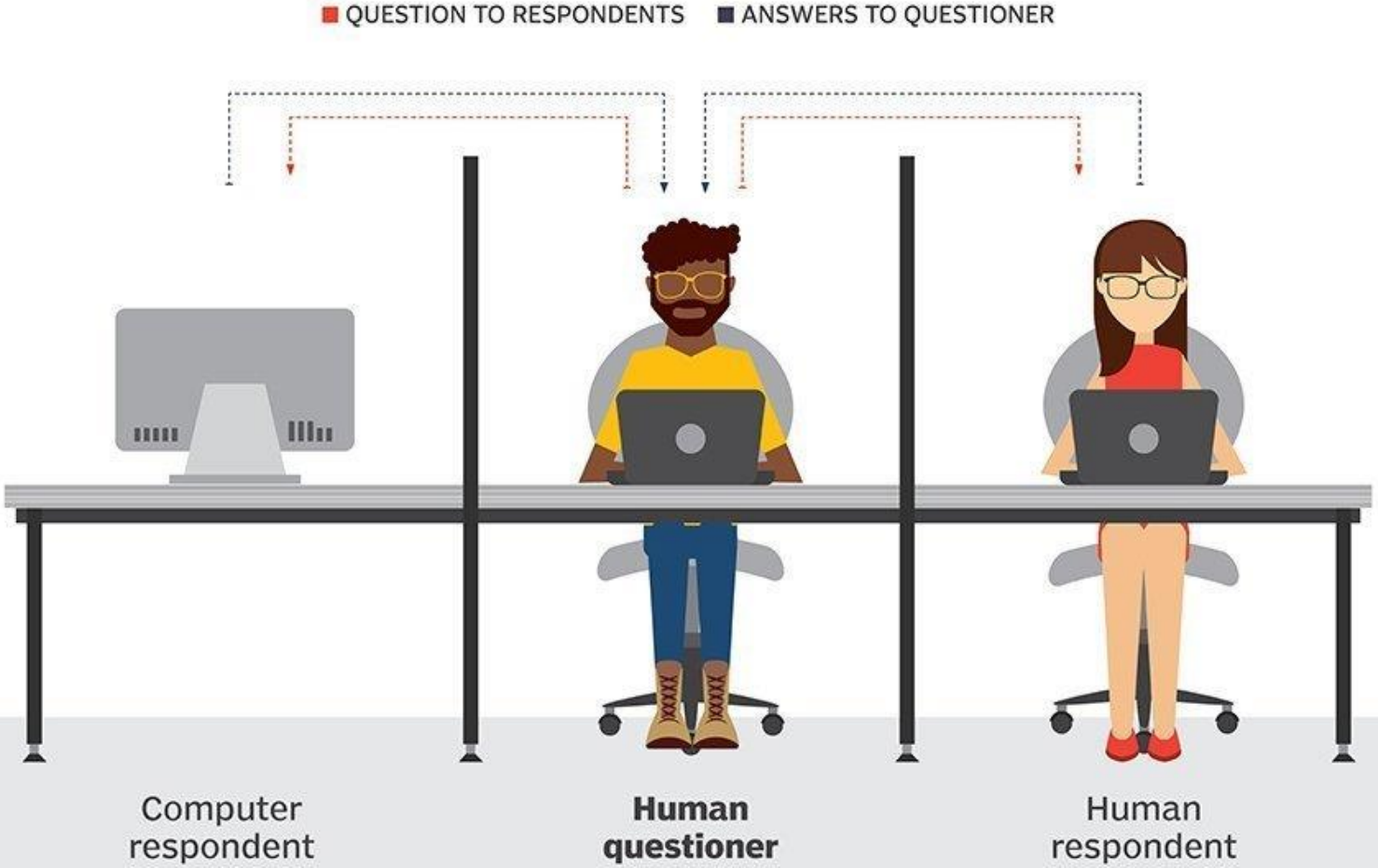
Views on Artificial Intelligence

Thinking humanly	Thinking rationally
Acting humanly	Acting rationally

The book advocates AI as: acting rationally

Turing test

During the Turing test, the human questioner asks a series of questions to both respondents. After the specified time, the questioner tries to decide which terminal is operated by the human respondent and which terminal is operated by the computer.



Chatbots

- ELIZA was the first chatbot
- made by Joseph Weizenbaum between 1964 and 1966
- very limited knowledge base
- operated most by string substitutions

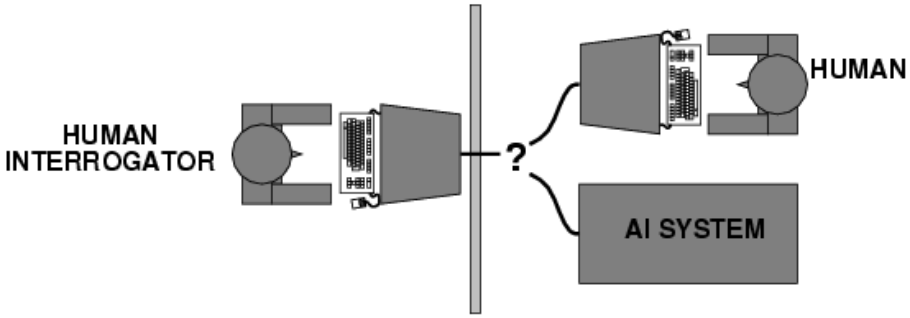
Human: What shall I do?
Eliza: That's quite interesting.
Human: What?
Eliza: What do you think ?
Human: I think I should work harder for my course
Eliza: Is it important to you that you have your course ?
Human: Well, kind of
Eliza: Lets discuss further why your course.
Human: I'm interested in it
Eliza: How long have you been interested in it ?
Human: since I was a child
Eliza: Were you really ?
Human: yes
Eliza: You seem to be quite positive.
Human: I usually am

Acting humanly: Turing Test

Turing (1950) "Computing machinery and intelligence":

"Can machines think?" → "Can machines behave intelligently?"

Operational test for intelligent behavior: the Imitation Game



Suggested major components of AI:

Knowledge, Reasoning, Language understanding, Learning

Thinking humanly: cognitive modeling

- We must have some way of determining how humans think.
- We need to get inside the actual workings of human minds.
- There are two ways to do this:
  - ❑ through introspection: catch our thoughts while they go by
  - ❑ through psychological experiments.
- The field of cognitive science brings together computer models from AI and experimental techniques from psychology to try to construct precise and testable theories of the workings of the human mind.

Thinking rationally: "laws of thought"

Aristotle: What are correct arguments/thought processes?

Several Greek schools developed various forms of *logic*: *notation* and *rules of derivation* for thoughts; may or may not have proceeded to the idea of mechanization

Direct line through mathematics and philosophy to modern AI

Problems:

1. Not all intelligent behavior is mediated by logical deliberation
2. What is the purpose of thinking? What thoughts should I have?

Acting rationally: rational agent

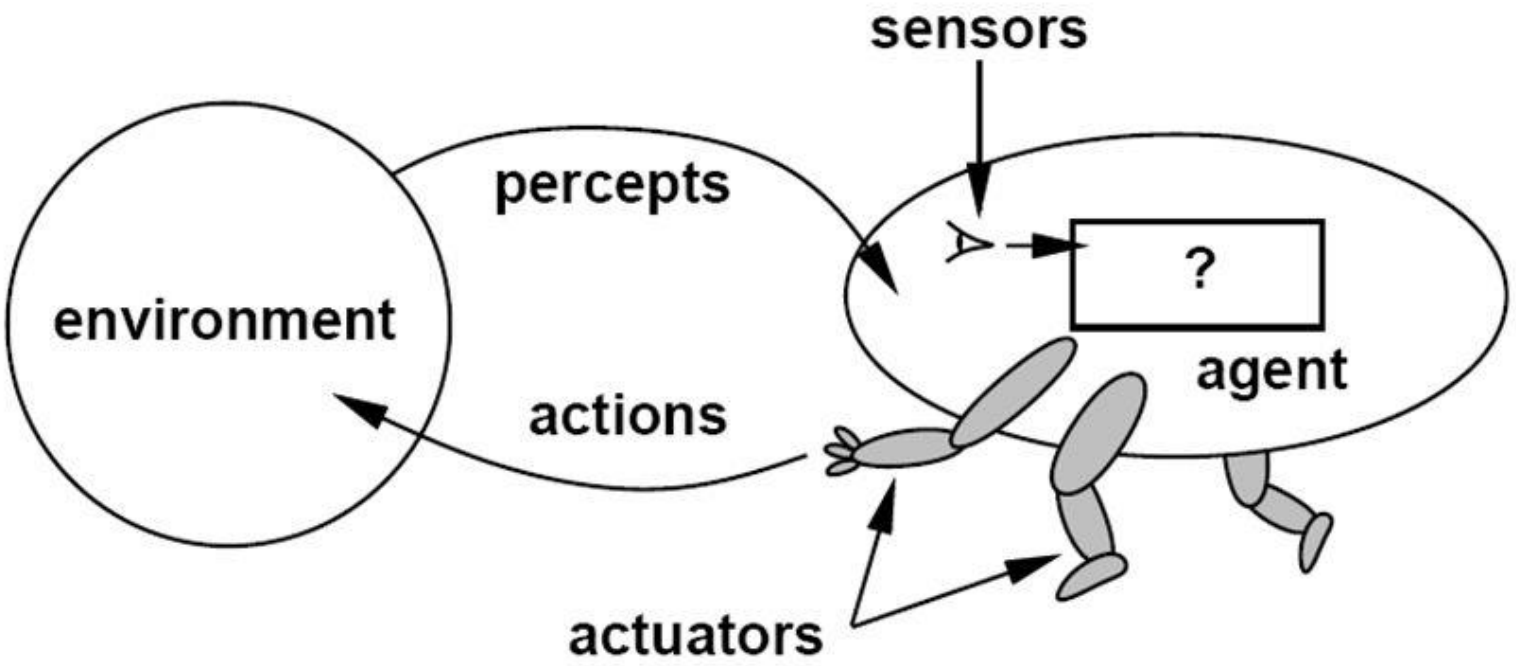
Rational behavior: doing the right thing

The right thing: that which is expected to maximize goal achievement, given the available information

Doesn't necessarily involve thinking – e.g., blinking reflex – but thinking should be in the service of rational action

Rational agents

- An agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators



Rational agents

An agent is an entity that perceives and acts.

This module is about rational agents.

Abstractly, an agent is a function from percept histories to actions:

$$[\, f: P^* \rightarrow A \,]$$

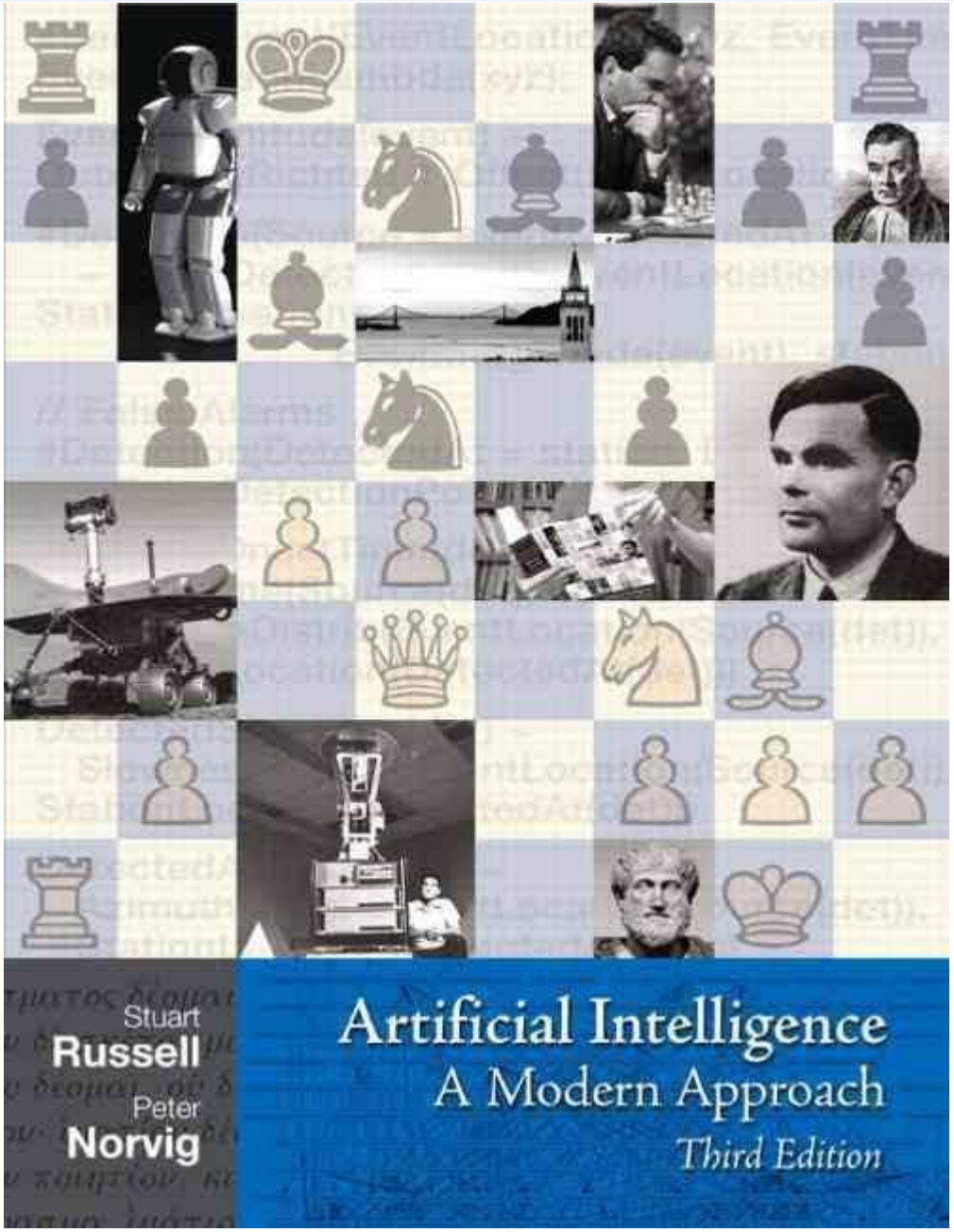
For any given class of environments and tasks, we seek the agent (or class of agents) with the best performance

Caveat: computational limitations make perfect rationality unachievable → design best program for given machine resources

Recommended reading

Stuart Russell, Peter Norvig: ***Artificial Intelligence A Modern Approach***

Chapter 1



ANY Questions?