WELCOME TO CIS 716.5

Artificial Intelligence

This is the Fall 2003 Evening Section.

 M 6.00pm - 8.05pm 234 New Ingersoll

Professor Simon Parsons

 email: *parsons@sci.brooklyn.cuny.edu*
 web: *http://www.sci.brooklyn.cuny.edu/~parsons*
 office: 0119 Ingersoll

Class web page:
http://www.sci.brooklyn.cuny.edu/~parsons/courses/716-fall-2003/

Course objectives I

- To introduce you to some of the more advanced theory and practical techniques in artificial intelligence.

- In particular, this course will teach you about:

  - Robotics;
  - Planning;
  - Game theory; and
  - Learning.

- All of these topics relate to how real agents decide what to do.

Course objectives II

- To give you experience of applying both the theory and practical techniques.

- In other words there are:

  - Homeworks; and
  - Projects.

- Homeworks will give you the chance to use the theory.

- Projects will give you the chance to use the practical techniques.

Course objectives III

- To give you a crticial insight into the subject of artificial intelligence.

- Some of the sessions will be given over to seminars on particualr topics.

- I will distribute material for you to read, and you will have to:

    - Propose (that is present) the material;
    - Criticize the material; and
    - Mediate the discussion.

Resources

- Lectures

- Lecture notes

- Web page

  - *http://www.sci.brooklyn.cuny.edu/~parsons/courses/716-fall-2003/*

- Readings

- Me

Lectures

- Our timetabled sessions run from 6.00pm until 8.05pm.

- I plan to break this into two individual "lectures" of around 60 minutes.

- These will appear on the timetable/syllabus as separate lectures.

- We will take a break of around 5 minutes between these lectures.

- Some of these (marked on the timetable) will be seminar-style discussions.

Office Hours

- Since I am teaching two sections of Artificial Intelligence this semester, there are two office hours a week.

- Monday 1.30–2.30

- Wednesday 5.00–6.00

- Feel free to come to either of these sessions.

Assessment

- Out of 100 points

- 4 homework assignments (20 points total)

- 2 exams (50 points total)

    - midterm (20 points)
    - final exam (30 points)

- 2 projects (30 points total)

- *note that the midterm date is tentatively set for October 29th but this is subject to change!*

- Extra credit will be available for good performance in the seminar sessions.

A word about homeworks

- Should be done on your own, as much as possible

- Get help from me, friends
  but you must acknowledge all help received by citing the names of those who helped you.

- This not only protects you from being accused of cheating, but also protects you in case your helper gives you misinformation

Homeworks: submission policy

- Homeworks are due on the day that they are due

- Here are the rules — please know them well:

  1. Hardcopies must be brought to class on Wednesday and deposited in the homework box at the front of the classroom.

  2. If your hardcopy does not make it into the box, it will not be accepted and you will get 0 for the homework.

  3. If you must miss class, have a friend deposit your hardcopy.

- Exceptions and extensions are possible, primarily based on MEDICAL EMERGENCIES.

- Circumstances must be documented and suitable arrangements will be made.

- You must consult me via email on an individual basis.

- Submission details for projects will be posted on the class web page.

Regrade policy

- If you feel that there was an error in grading your homework, project or exam, then you need to write on a piece of paper a description of the error.

- STAPLE the paper to your homework, project or exam and leave it with me to be regraded.

- Know that I mark with a list of expectations for each homework assignment, project and exam problem, knowing where to take off points — so if your complaint is that too many points were taken off for one kind of mistake or another in your homework, then generally those types of things will not change in a regrade.

- If there is a genuine error in the marking, like I thought something was missing, but it is really there, then you will likely get points restored.

- HOWEVER, a regrade means that the entire assignment or exam will be remarked, so be aware that your mark can go DOWN as well as UP.

- Regrades take while to process, so be patient — if you need the work to study from, then make a copy of it before you turn it in for a regrade.

A word to the wise

You all know that:

- You should save early and save often!

- Disk drives crash.

- Floppies have bad sectors

- Power supplies fail

- Monitors die

- Mice get trapped, and

- Paper print-outs are the best form of backup storage known to mankind.

So, you'll know that problems resulting from ignoring the above are not acceptable excuses for late submission of projects or homework.

A word about lectures

- Brief lecture notes will (usually) be placed on the web page before every lecture

- But they are NOT A SUBSTITUTE FOR COMING TO CLASS

- I know, I used to skip classes too

- If you must miss a class, YOU are responsible for getting notes from someone who did come to class

- You will usually be able to print the notes out before class, BUT:
  - you learn better when you actually have to write things down yourself
  - just reading along with my notes makes you sleepy
  - everything I say is NOT in the lecture notes, but anything I say MIGHT be on an exam or in a homework, so you need to take notes on what I say
  - sometimes there are mistakes in the lecture notes which get caught during class; so you will only get the correct version if you come to class and take notes.

A word about exams

Exams:

- Are the only way I know you are doing your own work
- Are the only way YOU know you are doing your own work
- Are not hard if you really know the material
- Notice my weighting scheme for exams
    1. midterm: 20%
    2. final exam: 30%

A word about seminars

- Seminars are one way for us to have a more interactive class.

- I will hand out readings (or post them on the web) the week before the seminar session.

- The week before we will choose (by volunteers if possible) people to propose and criticise the main idea of the reading, and to mediate the discussion.

- I will also post some possible "talking points" on the course web-site.

- Extra credit will be available to students who make a good (that is above average) effort in the seminars.

A word about feedback

- Homeworks, projects and exams let me know how you are doing.

- In a way, they let me know how I am doing, as a reflection of how you are doing.

- But, I welcome feedback from you.

- Email, anonymous written notes, comments during office hours.

A word about academic integrity

- The work you submit for assessment should be completed ON YOUR OWN.

- You may get help from me, friends.

- You must acknowledge all help given.

- You should not download material from the web and submit it as your own work.

- You should not mail code or copy files.

- If someone asks you to do this, *JUST SAY NO!*.

Topics covered

- The work in the course this semester will go deeper into some of the issues I covered in CIS 716 last semester.

- We will also deal with soem new things.

- In particular, this course will teach you about:

  - Robotics;
  - Planning;
  - Game theory; and
  - Learning.

Robotics

- We will be doing projects that involve robotics.

- To help with this, we will be studying some AI robotics research.

- We will cover:

  - Hardware
  - Perception and mapping
  - Behaviour-based robotics

Planning

- One thing that robots need to do, is to plan how to achieve their goals.

- We will look at some sophisticated techniques for planning:

  - Partial-order planning
  - Planning graphs
  - Hierachical task planning
  - Conditional planning
  - Execution monitoring

Game theory

- Another thing that robots have to do is to interact with one another (and other agents in the world).

- One way to decide what to do in such situations is to use *game theory*.

- We will look at some of the basics of game theory:

  - Zero-sum games
  - Nash equilibrium
  - Pareto optimality
  - The prisoner's dilemma.

Learning

- Finally, robots that live in the real world need to adapt to changes in the world.

- We will look at how learning techniques can help with this

  - Learning decision trees
  - Expolanation-based learning
  - Inductive logic programming
  - Reinforcement learning

About the instructor

- Undergrad: University of Cambridge, Engineering, class of 1988

- Grad school: University of London, PhD 1993

- Previous teaching:

  - Queen Mary & Westfield College, London, UK.
  - University of Liverpool, UK.
  - Universidad Politechnica de Catalunya, Barcelona, Spain.
  - Universidad Nacional del Sur, Bahia Blanca, Argentina.
  - Columbia University.

- research interests:

  - Software agents;
  - Rational action; and
  - Multi-agent systems.

About you.

- Please take out a piece of paper and write down...

  1. Your name.
  2. Your class and major OR if you are a non-matriculating student, categorize yourself.
  3. Why you are taking this course.
  4. What you hope to get out of this course.
  5. What you know about artificial intelligence.
  6. What is a good time for office hours.
  7. One sentence about one wonderful thing you did over the break.

- ...and give it to me before you go.