Artificial Intelligence

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Artificial Intelligence

• What are examples of AI?
Artificial Intelligence

• How would you define AI?
Artificial Intelligence

• Can we produce true AI?
Artificial Intelligence

- Can we produce true AI?
- Should we?
Artificial Intelligence

• Can we produce true AI?
• Should we?
• Why are you interested? (Why are you in this class?)
Artificial Intelligence

• What experience do you have with AI?
Syllabus

• Available online: JeffClune.com
• Read every word. A few times. Refer back often.
• It is your responsibility to know the syllabus
  • what follows is just a high-level summary

• Read it before next class:
  • write down questions while you are reading it
    - everyone write down at least one and bring it (I will call on people randomly)
  • we’ll discuss them next time
Meet Your Classmates

• Pair up, introduce each other
  • Something interesting about them
  • Previous experience with AI
Brief Intro to Me: Professional
Evolving Artificial Intelligence Lab

- Goal: robots that rival animals
  - Evolutionary computation
  - Evolutionary robotics
  - Deep learning
  - Neural networks
  - Computational evolutionary biology
  - etc.
We gave evolution four materials:

- Muscle: contract then expand
- Tissue: soft support
- Muscle2: expand then contract
- Bone: hard support
Undamaged robot controlled with classic tripod gait
Course Overview

• We’re going to take journey through AI-land together
  • Help you understand AI technology surrounding you
  • and intelligent agents (animals and humans, including you!)

• Learn about many sub-fields

• But not all: the field is too big
  • and visiting all would mean too shallow an understanding
  • I will balance competing goals: depth vs. breadth given limited time
Course Overview

• Focus will be on modern, cutting-edge AI
• Means not doing some “good old-fashioned AI” (GOFAI)
• Instead, wading into
  • Modern AI
  • Machine Learning
  • Data Mining
  • Bayesian *
Course Mechanics

• Grade
  • 30% - AI Challenges
  • 30% - Midterm
  • 30% - Course Project
  • 10% - Participation
Difficulty

• This class is hard
• and time consuming
• but you will learn a ton about AI
My Teaching Goals

• My goal
  • You learn a lot
  • You think the class was hard, but worth it

• Measuring goal attainment
  • This class was
    • The best class I have ever taken
    • One of the best
    • Average
    • One of the worst
    • The worst
My Teaching Goals

• My goal
  • You learn a lot
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• Measuring goal attainment
  • This class was
    • The hardest class I’ve taken
    • One of the hardest
  • Average
  • One of the easiest
  • The easiest
Feedback

• Please let me know if you would vote otherwise!

• Options
  • Tell me after/before/during class
  • Mid-term survey
  • Email
    - Including anonymous email!

• My promise:
  - I will strongly consider your feedback
  - Good chance I will implement it in some way
Textbook

• Russell & Norvig, AI: A Modern Approach, 3rd Edition
• 3rd edition!
Readings

• Reading assignments posted on syllabus
• Read before class
• Most from book, some original papers from literature
• You have one for next class!
• A LOT of material will be in the book, but not covered in lecture. You are responsible for that material (e.g. tests)
• I have made reading assignments 1/3rd of what’s typical so you read 100% of them
Lecture Notes

• Slides posted online within a day or three
• Let me know if I’m being slow
• Broken link means not posted yet
Piazza

- Online forum
- Wikipedia in spirit
- Ask and answer questions
- First test: let's pick a test question
  - enter your name / answer
  - note: aside from this, no need for your name
- Helps your participation grade
Laptops & Smartphones

- Hurts your learning
  - see syllabus for references
- Hurts everyone else too
  - by distracting me

http://goo.gl/lzlFjC
AI Challenges

• Implement AI concepts
  • Programming assignments
  • Language: Python
• 5 total (1-2 weeks per)
• Learn by *doing*
• Posted well ahead of time
  • broken link means not posted yet
Bonus Python XKCD

• http://xkcd.com/413
Midterm

• Will be late...more of a 3/4ths term
• Covers everything up to it
Academic Integrity

• Follow UW rules (link to them on syllabus)
• Class specific
  • No sharing code or pseudo-code
  • Talking to each other about ideas is OK, but giving answers to each other is not
  • When in doubt, ask first!
• I have zero-tolerance for cheating
  • so far I have brought formal charges every semester
Attendance

• Expectation is you attend every class
  • unless something critical comes up
  • take advantage of this opportunity

• Must attend
  • Midterm
  • Final presentations, including Final Exam time
  • Only excuses are approved by Dean of Students
    - “University Approved Excuse”
Course Project

• You choose some fun, interesting AI project
  • Doesn’t have to be publication-worthy, but new to you
  • Bonus points for ‘new to humanity’ (e.g. new application or game)
  • Can potentially publish!!!!!!! (4 so far)

• Produce a video describing
  • what you did
  • why
  • how well it worked

• Show video in class and take questions
  • video will be posted to Youtube
Course Project

- Project scope approved by me
- You can use code/libraries, but
  - you must make a significant AI contribution yourself
  - you must state in your credits what you used vs. what you did
Example Project From Previous Semester

Evolving robot controllers
Creative thinking approach
Participation

• 10% of grade

• Overall assessment of your
  • engagement
  • enthusiasm
  • curiosity
  • diligence
  • etc.

• In class and on Piazza
  • Just showing up is not enough!
Graduates vs. Undergraduates

- Expectations for grads on everything are higher
  - will be reflected in grades given

- Grads specifically
  - have larger/harder AI challenges
  - more reading (indicated on syllabus)
  - may have additional and or harder midterm questions
  - larger scope for course project
Late Policy

• Strictly Enforced
• Within 24 hours: 10% deduction
• Within 48 hours: 25% deduction
• Within 4 days: 50% deduction
• After: 100% deduction
Asking Questions Outside of Class

• Ask on Piazza so everyone can benefit from the answer
  • please do not email me directly unless it is a matter specific to you
Artificial Intelligence

• Huge field
  • Theoretical CS all the way to Applied Engineering
    - True for each area!
      - Vision
      - Touch
      - Smell
      - Planning
      - Learning
      - Reasoning
      - Walking
      - Poetry
      - etc. etc. etc. (Every task?)
• Lots

• My favorite:
  • “The study of how to make computers do things at which, at the moment, people are better.” (Rich and Knight 1991)
  • Examples:
    - Chess
    - Jeopardy
    - Object recognition (in transition)

• So how do we know when we arrive?