Organization

CPSC 383: Explorations in Artificial Intelligence and Machine Learning
Winter 2026

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University of Calgary

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Welcome!

Jonathan Hudson, Ph.D, Associate Professor (Teaching)

Lectures: CPSC 383

L01 MonWedFri 12:00-12:50 TI 160

Office: ICT 712

Office hours: MonWed 13:00-13:50 or by email-scheduled appointments. (Zoom possible by pre-arrangement)

jwhudson@ucalgary.ca

https://cspages.ucalgary.ca/~jwhudson/CPSC383FW26/

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Wait there's more!

Janet Leahy, Assistant Professor (Teaching)

Helped design CPSC 383

likely to teach in future, maybe Spring 2026

We hold Taylor Institute of Teaching and Learning grant together to study teaching related to course

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AEGIS

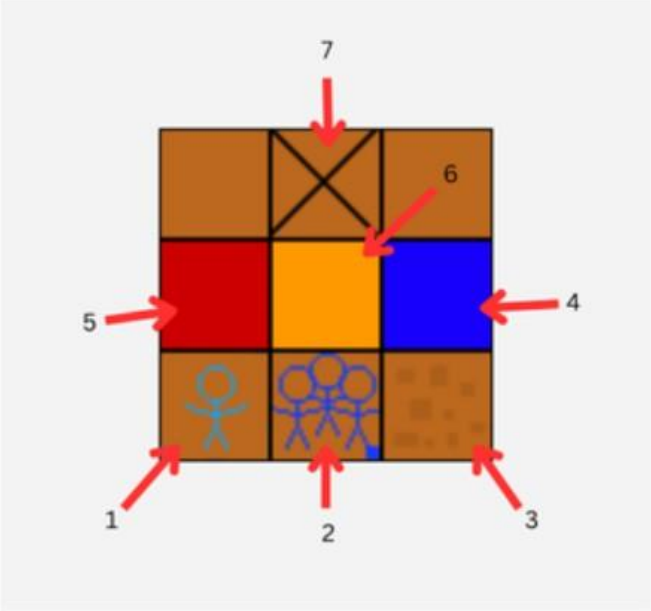
We will be using AEGIS, a custom multiagent framework for your first two assignments.

- Assignment 1 (individual)
- Assignment 2 (groups)

We will also have a bonus component on Assignment 2, with winning groups invited to give a presentation on the last day of classes.

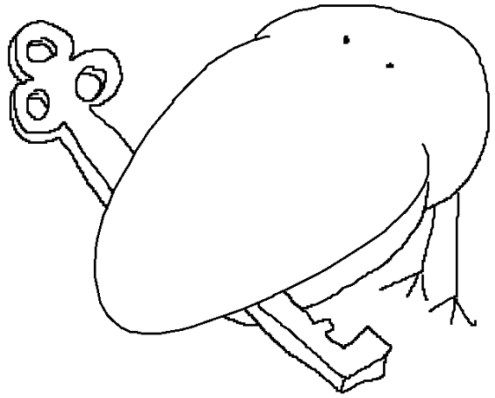
World Objects

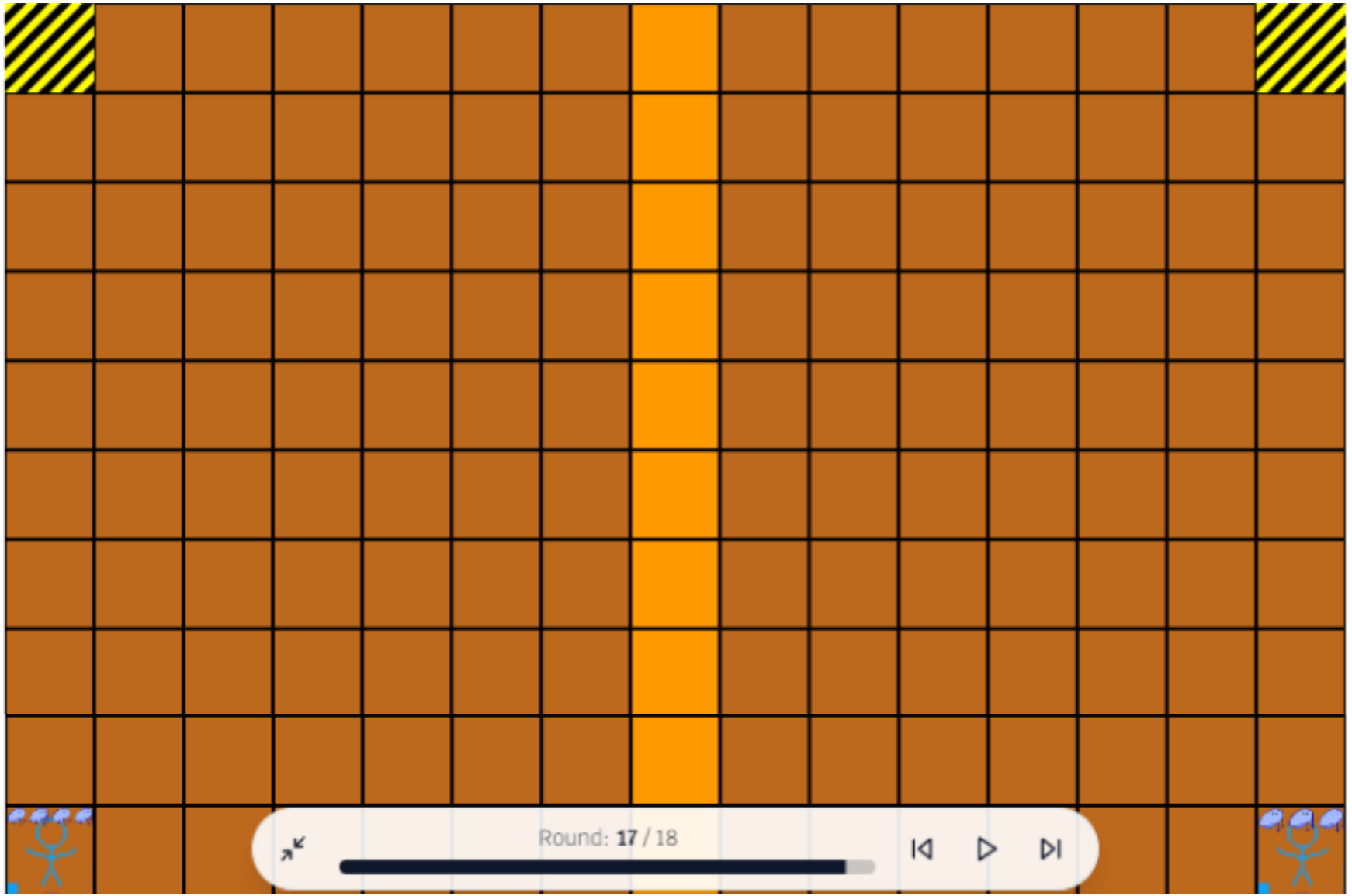
Below is an example of all the world types and objects:



1. Represents a survivor.
2. Represents a survivor group.
3. Represents rubble.
4. Represents a charging grid.
5. Represents a killer grid.

Dante Kirsman (left), Colton Gowans (right), and Goob (below), our amazing AEGIS developers





Location: (14, 0)

Cell Info

Cell Type: NORMAL_CELL

Move Cost: 1

Agents

1:

Layers

1 SV(100, 0, 0, 0)

Grading

Component	Weighting %
Quizzes (best 5 of 6)	15%
Part. (best 8 of 9)	15%
3 Assignments	15% * 3
3 Discussion/Reflections	7%+9%+9%

- Each piece of work (reports, assignments, quizzes, midterm exam(s) or final examination) submitted by the student will be assigned a grade. The student's grade for each component listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Minimum % Required	98 %	93 %	88 %	83%	78%	73 %	68 %	63%	58%	53 %	48 %

Grading

- Quizzes (15%)
  - Best 5 of 6, D2L, open 24 hours, 15-30 minutes to finish, based on last two weeks material
- Participations (15%)
  - Best 8 of 9, In tutorial exercise sheets completed in-person (1 a week)
- Assignment 1 and 3 (15% each)
  - Individual assignments
  - Symbolic assignment, connective assignment
- Assignment 2 (15%)
  - Team assignment
  - Combining AI
- Discussion/Reflection 1/2/3 (7%/9%/9% each)

Discussions

You will have three graded discussion activities during the semester.

For each discussion, you need to:

1. Complete a pre-reading assignment and upload to the D2L dropbox by 11:59 AM on the day before the discussion
2. Attend the in-person discussion during lecture time
3. Write up a reflection about your discussion and upload to the same D2L dropbox by 11:59 PM

Tutorials

Tutorials will begin on Next week

Some TAs prior experience with course, some new

In-person, point is active interaction with TA for material and assignment help.

Your enrollment tutorial TA is only responsible for the students enrolled in their tutorial.

There will be 9 participation exercise sheets completed and submitted in-person in tutorials this semester!

Out of lecture?

There is no attendance at tutorials **but there are 9 exercise sheets submitted in-person for course credit. Plan is one a week that doesn't have assignment deadline.**

- Start next week
- TAs will use tutorials to go through exercises an AI tools.
- Material will be covered and there will also be assignment help

There will be two individual assignments and one final team assignment.

There will be a number of D2L submissions. (quizzes/participations/reflections)

Who to ask

We will be using Discord as much as possible for course communication. This includes any questions you might have, so use it whenever you can’t get your questions answered in person.

Note that you can post publicly or message privately to myself and the TAs through Discord.

Why CPSC 383?

Many of you will have seen news stories, or used an application, that does some cool and have wondered how it did that.

This course is your start down the path of how AI makes much of these things possible.

Course Goal

From the calendar:

- “A survey of artificial intelligence and machine learning tools to cultivate an understanding of their capability, utility, and societal/ethical/legal considerations. Popular APIs will be used to develop simple applied examples. ”

Course Outcomes

From the outline:

1. **Definitions**: Define simple artificial intelligence and machine learning terms.
2. **Areas**: Identify common areas of artificial intelligence and where they occur in computing contexts.
3. **History**: Identify important eras and dates from artificial intelligence and machine learning and describe their characteristics and impact.
4. **Create**: Implement simple deployments of artificial intelligence solutions using existing technologies to solve fundamental computing problems.
5. **Compare**: Compare and contrast the capabilities of different solutions from different areas of artificial intelligence.
6. **Reflect**: Reflect on current societal, ethical, and legal considerations related to artificial intelligence.
7. **Future**: Recognize and discuss developing research areas in artificial intelligence.

Course Policies

- When you email include your first name, and last name.
- Please use “CPSC383W26” as the prefix in the subject line

- Quizzes will have a hard deadline in D2L. Participations completion will be recorded in tutorials. Late submissions will receive a grade of 0. Only the best 5 of 6 quiz submissions for each will be used towards the final grade, so the first missed will immediately become the lowest grade of 6 and dropped in the grade calculation. Only the best 8 of 9 participation submissions for each will be used towards the final grade, so the first missed will immediately become the lowest grade of 9 and dropped in the grade calculation.
- For late individual assignments, those submitted within 24 hours of the initial deadline will receive 10% off, and within 48 hours will receive 20% off. After 48 hours, no late assignments will be accepted.
- Reflections require in-person attendance on a specified lecture day for a discussion. Missing the in-person discussion will result in getting no marks for that portion of the reflection rubric.
- Any request for an altered deadline should come the Friday a week before the assignment deadline. Later emergency long-term requests will be reviewed on a case-by-case basis by the instructor. Students will be required to provide evidence such as through the FoS missed term work form, office hours, or by email. Any documentation collected will be handled according to university policies and regulations around its collection.

Generative AI

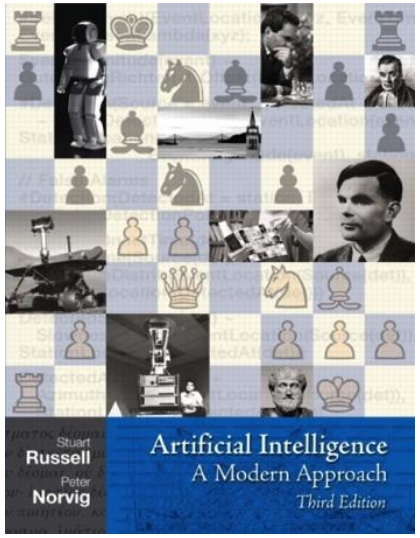
We will work together to have clear policies on how and when you are allowed to use generative AI in your submitted work.

In fact, we will sometimes require you to do so!

… but don’t count on it to be helpful on many of the course requirements.

Textbook

- Not required, but for students who want to read more we recommend
  - Russell & Norvig, AI: A Modern Approach



  - Warning: Not a course textbook, so our presentation does not necessarily follow the presentation in the book.

Warning?

A warning

This is a rather new course. From top to bottom.

Slides may have errors. Deadlines may have to move. Planned material may be adjusted. Assignments will have typos and hiccups in design.

Not a warning (I): Logic

- There will be **no formulas** like

  $\forall x \, \exists y \left(P(x) \rightarrow \neg Q(y)\right)$

  $p \ \wedge (q \ \vee \neg r)$

  $\forall x \, \forall y \, EQ\big(f(x), g(x,y)\big)$

  to memorize

- Also, **no Calculus** rules like

$$\frac{C \vee P \, , D \vee \neg P'}{\sigma(C \vee D)} \quad \text{If } \sigma(P) \equiv \sigma(P')$$

Not a warning (II): Mathematical modeling

If you take CPSC 433 instead you might see something like

$Prob = \{(1, c_2, \ldots, c_i) \mid c_i \in \{2, \ldots, n\}, 1 \leq i \leq n\}.$

$Erw\left(((1, \ldots, c_{n-1}), ?), ((1, \ldots, c_{n-1}), yes)\right).$

$Erw\left(((1, \ldots, c_i), ?), ((1, \ldots, c_i), yes)\right),$

if $f_{bound}((1, \ldots, c_i))$ is larger or equal to the best solution to the problem instance found so far

$$Erw\left(((1, \ldots, c_i), ?), \left((1, \ldots, c_i), ?, \left((1, \ldots, c_i, c'_{i+1,1}), ?\right), \ldots, \left((1, \ldots, c_i, c'_{i+1,k}), ?\right)\right)\right),$$

$if\ k = n - i, \{c'_{i+1,1}, \ldots, c'_{i+1,k}\} = \{2, \ldots, n\} - \{c_2, \ldots, c_i\},$
$c'_{i+1,j} < c'_{i+1,p}$ if $j < p$.

and so on

Not a warning (III)

You will **not** have to be able to understand formulas and formal definitions like the ones on the last slides

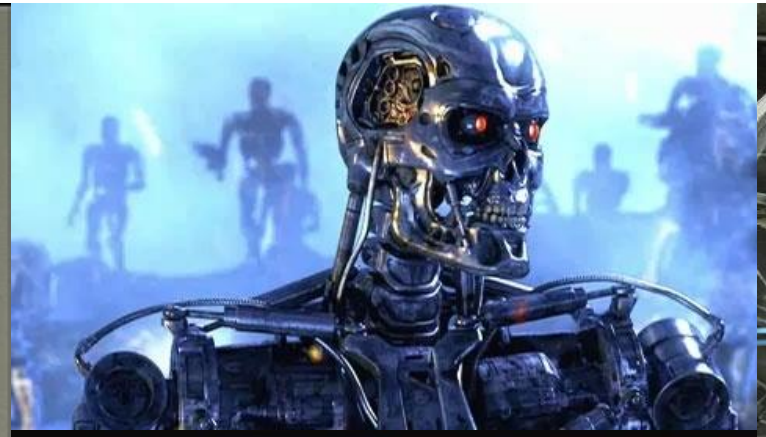
You will **not** have to create such formal structures yourself!

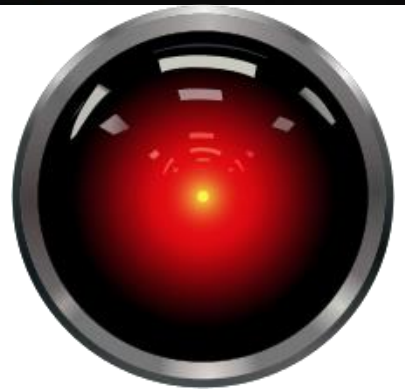
You **will** use existing languages, tools, and framework to code or link to already created AI solutions.

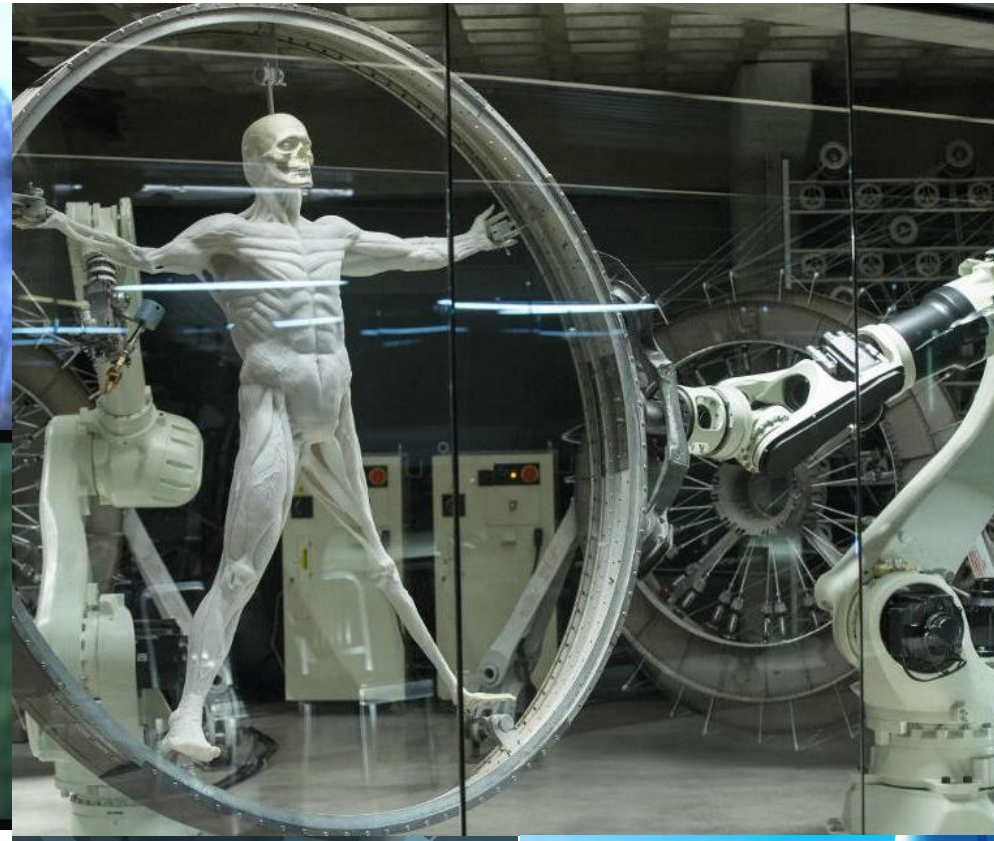
You **will** learn how to reason about when it is appropriate to use these and what they are capable of.

AI?

Artificial Intelligence – What you may think of

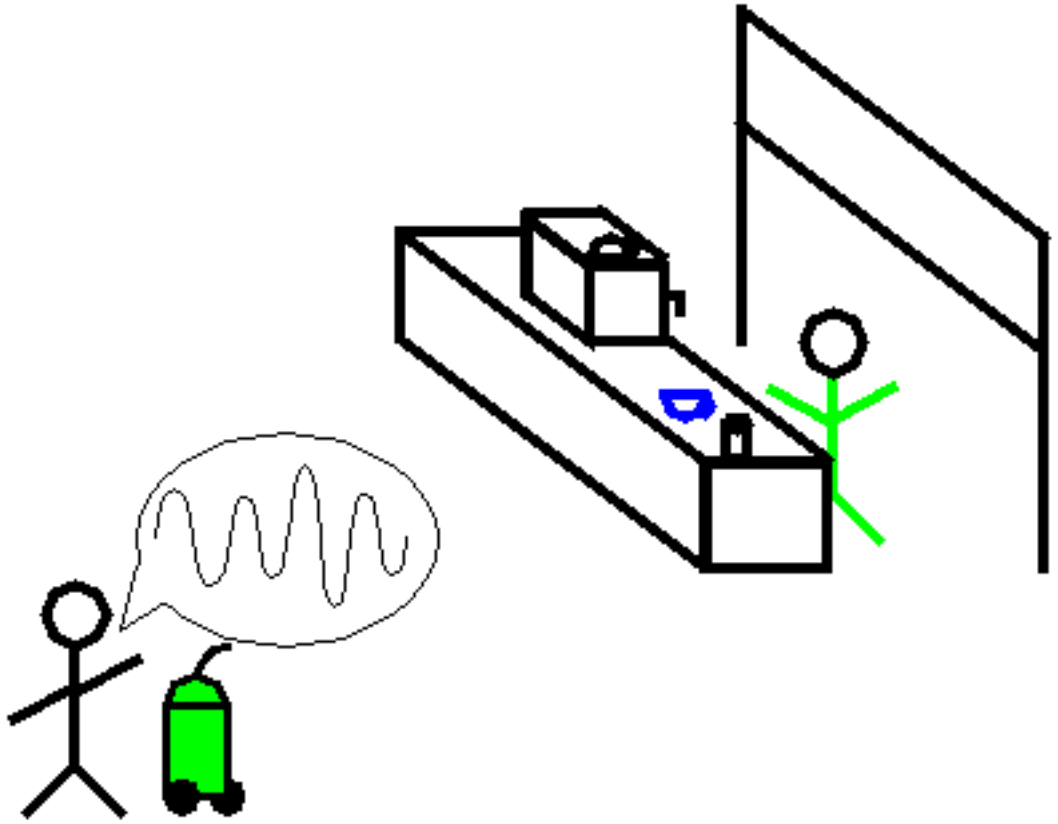






The challenge?

Artificial Intelligence -
An example of what we face



Example -
and we do not want

Example - What is involved (I)

“Can you get me a coffee, please ? (or !?)”

Tasks:

- Hear the sentence and transfer it in a written version
- Parse and “understand” the written version (i.e. transfer it into an internal representation)
  - ☞Natural language understanding (from sound->words->text->meaning)
  - ☞Knowledge Representation
- Use sensory input to identify the current situation and possibilities
  - ☞Vision

Example - What is involved (II)

- Define a goal; learned information about user (he likes his coffee with cream and sugar) is necessary
  - ☞Machine Learning
  - ☞Deduction
- Planning what to do:
  - Move to coffee bar
  - Interact with waiter
  - Prepare coffee (add cream and sugar; stir)
  - Bring coffee to user
  - ☞Planning

Example - What is involved (III)

- Move to waiter
  - ☞Robotics (but also Vision, (Re-)Planning)
- Deal with waiter
  - ☞Natural language generation
  - ☞Human-computer interaction
  - ☞Multi-Agent Systems (if waiter is or has a robot)

Next…introduction to AI

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