Methods in AI Research

(MAIR)

Introduction

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Co-coordinators: Chris Janssen & Rosalie Iemhoff

Thursday, 3 September 2020


NOTICE
Only one person in this meeting room at a time

A course that introduces you to a great variety of Utrecht topics in AI.

A course that teaches you various AI skills.

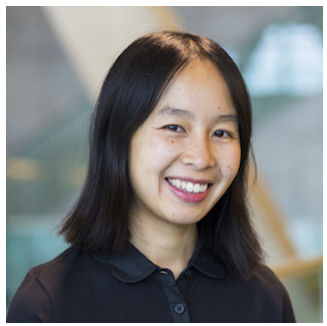
A course to improve skills that need improving.

A course in which you get acquainted with your fellow students.

Dragan Doder

Coordinator

Dong Nguyen



Chris Janssen

Marijn Schraagen

Rosalie Iemhoff

7 lab assistents

Blackboard

Definitions of AI in Russell & Norvig - Artificial Intelligence. A Modern Approach:

(TH): The exciting new effort to make computers think . . . machines with minds, in the full and literal sense.

(TR) The study of mental faculties through the use of computational models.

(AH): The study of how to make computers do things at which, at the moment, people are better.

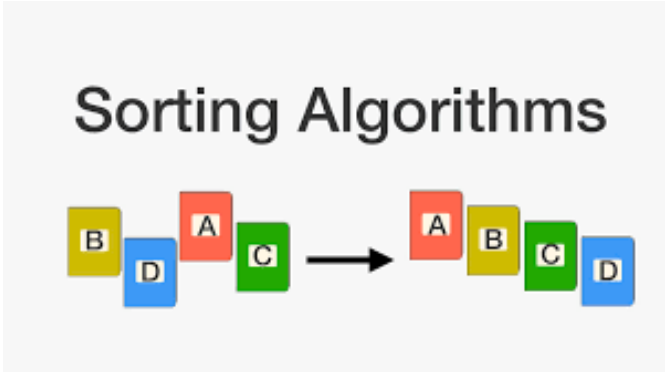
(AR): Computational Intelligence is the study of the design of intelligent agents

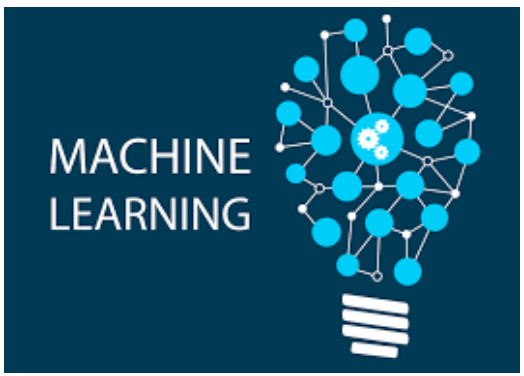
(TH) Thinking humanly

(TR) Thinking rationally

(AH) Acting humanly

(AR) Acting rationally


Sorting Algorithms
B
D
A
C
A
B
C
D


MACHINE
LEARNING


THE #1 PROGRAMMER EXCUSE
FOR LEGITIMATELY SLACKING OFF:
"MY CODE'S COMPILING."
HEY! GET BACK TO WORK!
COMPILING!
OH. CARRY ON.


Speech Recognition Technology


What are you doing?
Playing with this.

Research in Artificial Intelligence takes place in various disciplines:

- computer science
- psychology
- linguistics
- mathematics
- logic
- neurology
- philosophy
- humanities

Flavors:

- machine driven versus data driven
- theory versus engineering

⋮

These fields have different research methods:

- algorithms
- statistics
- natural language processing
- mathematical proofs
- logical methods
- engineering

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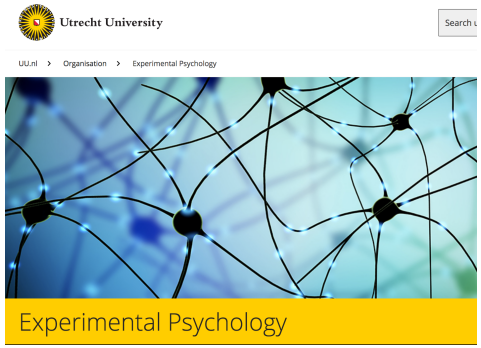
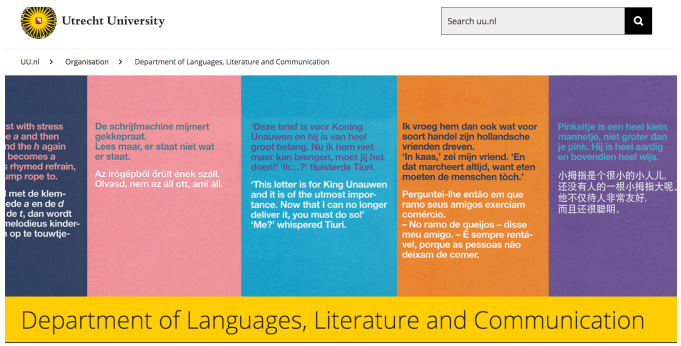
Research in AI in Utrecht is broad and interdisciplinairy.

Four departments are involved in the master:

All these departments are involved in MAIR.





Know and understand the basics of

- Agents
  Dialogue modelling, autonomous dialogue system
- Reasoning
  Knowledge-based systems, logic
- Cognitive Processing
  Cognitive modelling, experimentation, interaction
- Natural Language
  Natural language processing, communicating with an online bot
- Machine Learning
  Decision trees, the learning problem

You will be able to:

1. Implement different AI techniques in a working program
2. Test and evaluate an AI system (technical capabilities, performance, usability)
3. Write a technical report and a research paper on an AI system, its evaluation and its place in the broader context of AI

Note that you are expected to achieve all these goals at a basic level. You will know where to find more information, and be in a good position to take further classes in which the above skills are deepened.

Note Students have different backgrounds. In the group project try improve the skills that need improving and apply the skills you already have. Teach/help each other.

Building, evaluating and writing about an autonomous dialogue system that understands natural language, does some reasoning, and interacts with the user in a reasoned dialogue.

- Understanding and modelling a specific knowledge domain
- Implementing and empirically evaluating a NLP algorithm based on machine learning
- Implementing a working AI system in Python that does a bit of reasoning in a confined domain.
- Designing and conducting an experiment with human participants to emperically evaluate your system
- Writing a scientific report about your system and the empitical evaluation.

MAIR is a master course, following it requires the corresponding *master (student) attitude*:

Study the indicated literature, listen to the lectures.

If you don't understand something, ask the teacher during class, fellow students outside class, look in the library, internet, ask family, ...

If you need additional reading/studying material, ask the teacher during class.

Take innitiative.

Look for useful examples.

Help each other, share information, pass on skills.

Success with your studies!