Foundations of Artificial Intelligence

0. Organizational Matters

Malte Helmert

Universität Basel

February 22, 2016

Organizational Matters

People: Lecturers

Lecturers

Prof. Dr. Malte Helmert

- email: `malte.helmert@unibas.ch`
- office: room 06.004, Spiegelgasse 1

Dr. Martin Wehrle

- email: `martin.wehrle@unibas.ch`
- office: room 04.005, Spiegelgasse 1

People: Assistant

Assistant

Dr. Thomas Keller

- email: `tho.keller@unibas.ch`
- office: room 04.005, Spiegelgasse 1

People: Tutor

Tutor

Patrick Buder

- email: `sipa.buder@stud.unibas.ch`

Time & Place

Lectures
- time: Mon 17:15-19:00, Fri 13:15-15:00
- place: room 05.002, Spiegelgasse 5

Exercise Sessions
- time: Fri 15:15-17:00
- place: room 05.002, Spiegelgasse 5

first exercise session: next week (March 4)

AI Course on the Web

Course Homepage

`http://informatik.unibas.ch/fs2016/`
`grundlagen-der-kuenstlichen-intelligenz/`

- course information
- slides
- exercise sheets and materials
- bonus materials (not relevant for the exam)

registration:

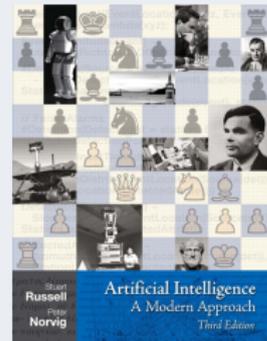- `https://services.unibas.ch/`

Course Material

course material:

- slides (online + printed handouts)
- textbook
- additional material on request

Textbook

Artificial Intelligence: A Modern Approach
by Stuart Russell and Peter Norvig
(3rd edition)

- available at Karger Libri
- covers large parts of the course,
  but not everything

Target Audience

target audience:

- Bachelor Informatik (computer science), ∼3rd year
- Bachelor Computational Sciences, ∼3rd year
- other students welcome

prerequisites:

- algorithms: solid knowledge
- programming: solid knowledge
- complexity theory: basic knowledge

Exam

- oral examination (20–25 min)
- dates: June 22–24
- 6 ECTS credits
- admission to exam: 50% of the exercise marks
- no repeat exam

Exercises

Exercise sheets (homework assignments):

- mostly theoretical exercises
- occasional programming exercises

Exercise sessions:

- discussion of exercise sheets
- questions about the course
- participation voluntary but highly recommended

Theoretical Exercises

theoretical exercises:

- exercises on course homepage every Friday
- solved in groups of at most two ($2 = 2$)
- due Friday of following week (23:59) via Courses

Programming Exercises

programming exercises (project):

- project with 3–4 parts over the duration of the semester
- solved in groups of at most two $(2 < 3)$
- programming languages?, operating systems?
- solutions that obviously do not work: 0 marks

Plagiarism

Plagiarism (Wikipedia)

Plagiarism is the "wrongful appropriation" and "stealing and publication" of another author's "language, thoughts, ideas, or expressions" and the representation of them as one's own original work.

consequences:

- 0 marks for the exercise sheet (first time)
- exclusion from exam (second time)

if in doubt: check with us what is (and isn't) OK before submitting

exercises too difficult? we are happy to help!

About this Course

AI in Basel

- research group Artificial Intelligence (AI) at the DMI exists since June 2011
- assistants:
  - Dr. Gabriele Röger
  - Dr. Martin Wehrle
  - Dr. Thomas Keller
  - Florian Pommerening
  - Silvan Sievers
  - Jendrik Seipp
  - Manuel Heusner
  - Salomé Simon
- http://ai.cs.unibas.ch/

Research Groups of the Computer Science Section

research area "Distributed Systems":

- Computer Networks (C. Tschudin)
- Databases and Information Systems (H. Schuldt)
- High Performance Computing (H. Burkhart, F. Ciorba)

research area "Machine Intelligence":

- Artificial Intelligence (M. Helmert)
- Biomedical Data Analysis (V. Roth)
- Graphics and Vision (T. Vetter)

Classical AI Curriculum

"Classical" AI Curriculum

1. introduction

2. rational agents

3. uninformed search

4. informed search

5. constraint satisfaction

6. board games

7. propositional logic: foundations

8. propositional logic: satisfiability

9. predicate logic

10. modeling with logic

11. machine learning

12. classical planning

13. probabilistic reasoning

14. reasoning under uncertainty

15. decisions under uncertainty

16. acting under uncertainty

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⇝ wide coverage, but somewhat superficial

Our AI Curriculum

Our AI Curriculum

1. introduction

2. rational agents

3. uninformed search

4. informed search

5. constraint satisfaction

6. board games

7. propositional logic: foundations

8. propositional logic: satisfiability

9. ~~predicate logic~~

10. ~~modeling with logic~~

11. ~~machine learning~~

12. classical planning

13. ~~probabilistic reasoning~~

14. ~~reasoning under uncertainty~~

15. ~~decisions under uncertainty~~

16. acting under uncertainty

Topic Selection

guidelines for topic selection:

- fewer topics, more depth, more emphasis on programming projects
- connections between topics
- avoiding overlap with other courses
  - Pattern Recognition (T. Vetter, BSc)
  - Machine Learning (V. Roth, MSc)
- focus on algorithmic core of modern AI

Under Construction. . .

- A course is never "done".
- We are always happy about feedback, corrections and suggestions!