AI Research Seminar (E031800)

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0 **Study time** 90 h

Course offerings in academic year 2023-2024

A (semester 1)   English   Gent

Lecturers in academic year 2023-2024

Demeester, Thomas	TW05	lecturer-in-charge
De Bie, Tijl	TW06	co-lecturer

Offered in the following programmes in 2023-2024	crdts	offering
Master of Science in Computer Science	3	A
Master of Science in Computer Science Engineering	3	A
Exchange Programme in Computer Science (master's level)	3	A

Teaching languages

English

Keywords

Research, Artificial Intelligence, Machine Learning, Data Science, Natural Language Processing, Computer Vision, Intelligent Agents, Robotics, Expert systems

Position of the course

Research in classical as well as new fields within the broad domain of Artificial Intelligence is rapidly growing, with numerous contributions every month both from the academic world and from industrial research organizations. Keeping track of the main trends and selecting contributions to study in depth is not obvious.
The goal of this course is to give students experience in critically following up and filtering recent AI research publications, as well as in processing and presenting them.
This course will be part of the list of elective courses for the Major in AI within the Master of Science in Computer Science Engineering

Contents

- The first two lectures describe the purpose of the course, provide a map of the AI research landscape (sub-areas and the most important conferences and journals), provide some guidelines on how to follow up on AI research (e.g., official conference proceedings vs. dedicated social media channels), on how to critically read AI research papers, and on how to present AI research.
- During the class, students work in groups of 2, although depending on the number of students registered for the course students may also work alone or in groups of no more than 3.
- After the introductory lectures, a few sessions are organized as a flipped classroom, for which student groups each prepare overview presentations of 3 AI research topics for further investigation and in-depth presentation in later lectures. The presentations will highlight the main motivations, challenges, and contributions, citing 2-4 high-quality references for each topic.
- The consecutive lectures are also organized as a flipped classroom: they consist of two in-depth scientific presentations of 1 AI research topic each (25' presentation + 10' Q&A), presented by a student group. Practical arrangements may be adapted to the number of subscribed students.
- For the overview presentations, students may select the topics and papers they present themselves, although they must be timely and of high quality. E.g. they may have been published as full-length papers in the most recent editions of top conferences in AI broadly

defined (ICML, NeurIPS, KDD, AAAI, IJCAI, ACL, EMNLP, NAACL, RSS, ICRA, IROS, ICCV, IJCAI, ECAI, ECML-PKDD, and others subject to approval), or in a recent issue of a top AI journal. An additional criterion is that the topics chosen must differ from the topic of the Master thesis.

- For the in-depth presentation, the research topic is selected by the lecturers from the topics covered in the student group's overview presentation, based on timeliness, quality, scientific depth, and complementarity with the topics of the other groups, and of the Master thesis. Except when none of the 3 topics from the overview presentation was of sufficient quality, the topic will be chosen by the lecturers.
- After each in-depth presentation, each student submits a short assessment (of maximum 200 words), providing:Colleagues or other external experts will be invited where useful to join specific lectures.
  - A summary of top creative idea / main contribution in the presented papers;
  - A peer-assessment in the form of anonymous constructive qualitative feedback along different dimensions (educational qualities, technical clarity and correctness of the presentation, quality of the answers to questions).
- Colleagues or other external experts will be invited where needed, to participate in specific sessions.
- If more than 42 students register for the course, parallel sessions may be organized. If fewer than 14 students register for the course, students will work on their own, and will be expected to present more than 1 topic in an in-depth presentation.

Initial competences

A good understanding of Artificial Intelligence and Machine Learning methods.

Final competences

1 Ability to critically read recent AI research papers, critically understand the main contributions and insights generated, present this understanding to an audience of peers, and engage in a dialogue with the audience in a Q&A session.
2 Ability to critically follow and interact during AI research presentations given by peers.
3 In-depth knowledge of some well-chosen recent research directions in AI.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Independent work

Extra information on the teaching methods

Guided self-study, flip-the-classroom, presentation, group discussion.

Learning materials and price

- High-quality and timely research papers freely available online.
- For the first two lectures, slides provided by the lecturers.

References

Course content-related study coaching

By the teachers and the assistants, before, during or after contact sessions, or by appointment or via the e-learning system.

Assessment moments

continuous assessment

Examination methods in case of periodic assessment during the first examination period

Examination methods in case of periodic assessment during the second examination period

Examination methods in case of permanent assessment

Oral assessment, Presentation, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

- Based on each student's own presentations:
  - The experts provide an assessment of each presentation with a mark (the experts can be one or both of the lecturers, or experts invited by them as and when the subject matter requires this).
- Based on each student's anonymous written feedback on other students' presentations:
  - After each seminar, students submit a short assessment (see above), which will be scored by the lecturers for insight and understanding.
  - As explained above, students are also asked to provide anonymous qualitative constructive feedback to the other students' presentations. The quality of this feedback will be assessed by the lecturers.

Calculation of the examination mark

Presentations (50%):
- 15%: clarity and style of the overview presentation.
- 20%: clarity, style, and scientific correctness of the in-depth presentation.
- 15%: clarity and scientific quality of the answers during the Q&A after the in-depth presentation.

Feedback and active participation (50%)
- 20%: evidence of understanding as demonstrated by written summaries of other in-depth presentations.
- 30%: active participation (in Q&A or debate sessions) and quality of the constructive feedback to the presentations from peers.