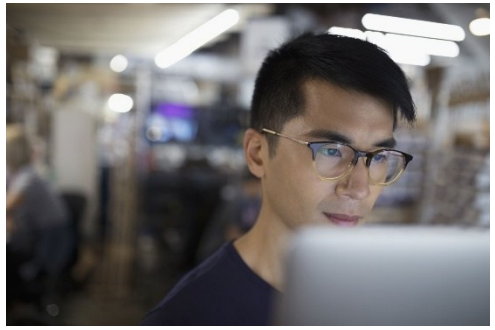
Logically Constrained Answer Generation with LLMs

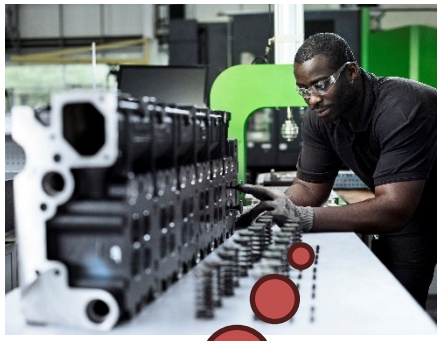
UNIVERSITÄT MANNHEIM

LLMs can answer practically anything, but…



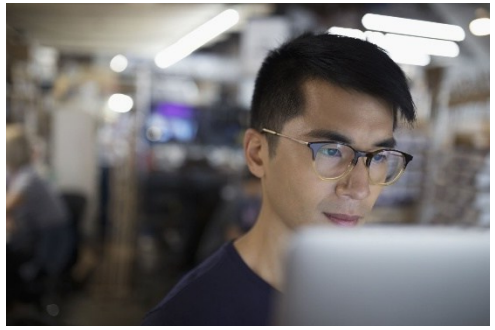
I study MMDS in Mannheim and want to hear more about AI applications. Which courses do you recommend for the upcoming spring term?

You may attend this course:
Business AI for Marketing and Sales (MKT 625).



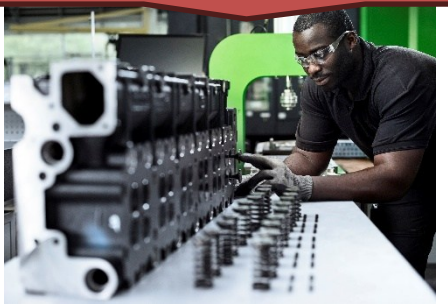
Wait… this course is not open to MMDS students, and it is only offered in the autumn term.

LLMs need constraints to answer correctly



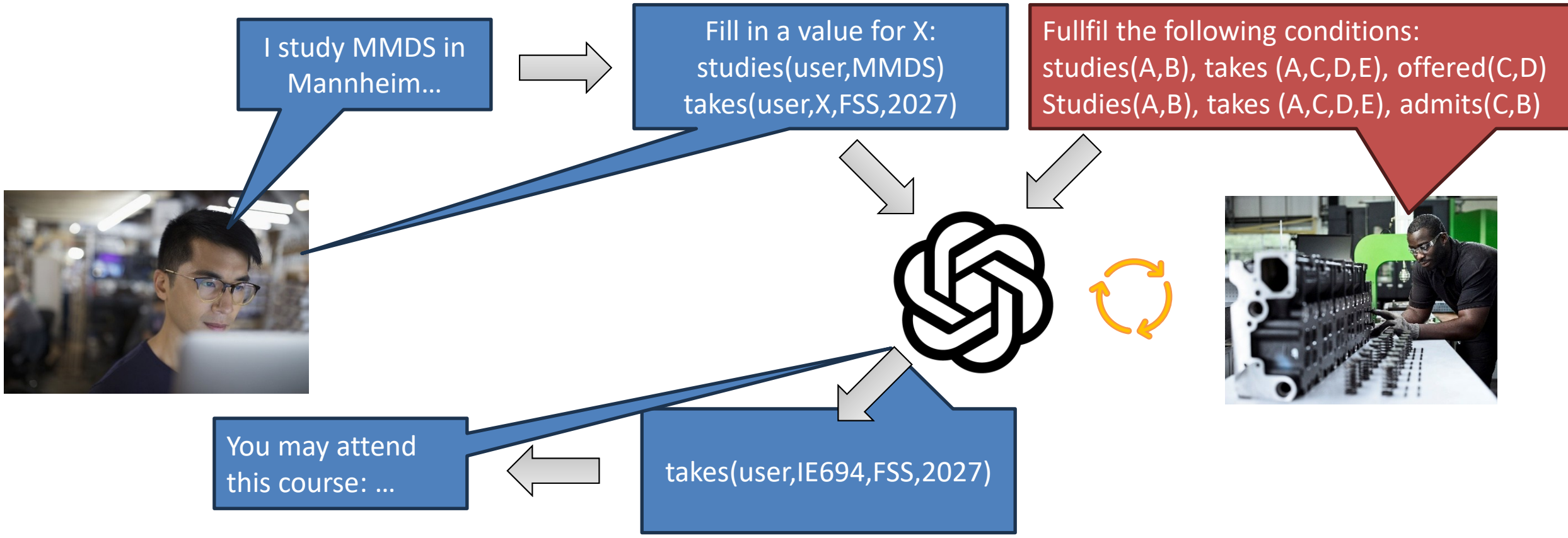
I study MMDS in Mannheim and want to hear more about AI applications. Which courses do you recommend for the upcoming spring term?

Make sure that the course
- admits MMDS students
- is offered in the spring term



You may attend this course:
Industrial Applications of Artificial Intelligence (IE 694)

Your task

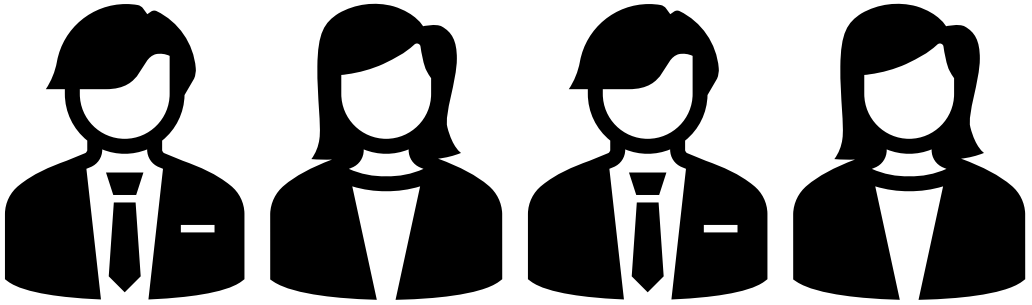

I study MMDS in Mannheim…
Fill in a value for X:
studies(user,MMDS)
takes(user,X,FSS,2027)
Fullfil the following conditions:
studies(A,B), takes (A,C,D,E), offered(C,D)
Studies(A,B), takes (A,C,D,E), admits(C,B)
You may attend this course: …
takes(user,IE694,FSS,2027)

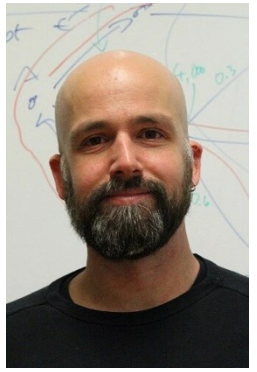
Roadmap

- Start with a simple toy example
  - E.g., creating a class schedule for a school
  - Create logic schema, translation logic, and rules
  - Test performance of LLMs with/without logic layer
- Roll out to real world use case
  - Student counseling
  - Try hand-written rules first
  - Extension: automatic rule extraction from study regulations and module catalogs
  - Again: Test performance of LLMs with/without logic layer

Mutual Expectations

- We expect
  - Prior knowledge in programming & LLMs
  - Familiarity with logics
  - Creativity, dedication, and independence
- You can expect
  - A cutting-edge topic
  - Introduction to modern research methods
  - Nice supervisors ;-)





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