– Seminar –

Predicting Cognition via Machine Learning

apl. Prof. Dr. Dr. Marco Ragni
Nicolas Riesterer, Lukas Elflein

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Cognitive Computation Lab,
Department of Computer Science,
University of Freiburg

No researchers are gods

Some gods are great reasoners

What (if anything) follows?

No researchers are gods

Some gods are great reasoners
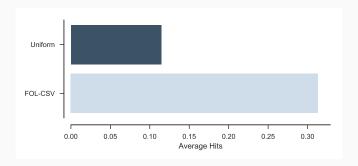

Some great reasoners are not researchers

- Categorical assertions
- Quantifiers (All, Some, Some ... not, None)
- Syllogisms combine two premises
- Nine possible responses
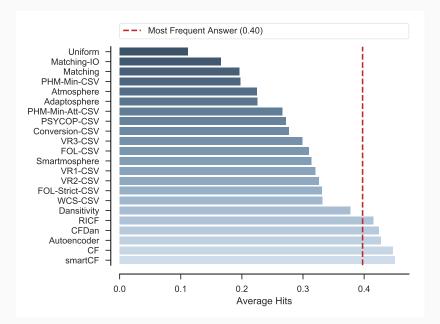- Total of 64 syllogisms

No A are B
Some B are C
———————
Some C are not A

- Psychology has identified numerous effects and phenomena surrounding reasoning
- Surely the problem can be considered solved at this point
  ... or can it?

Modeling Syllogistic Reasoning

Objective of the Seminar

1. Familiarize yourself with the literature on cognitive modeling of human syllogistic reasoning
2. Implement a model
   - Phenomena/Effects identified by psychology or cognitive science
   - Probability calculus (e.g., Bayes)
   - Logic systems (e.g., nonmonotonic logics, answer set programming)
   - Machine learning (e.g., neural networks, recommender systems)
   - ...
3. Competition between different modeling approaches
4. Give a presentation on your findings
5. Write a technical report about your results

Modeling Syllogistic Reasoning Using CCOBRA

```python
class MyModel(CCobraModel):
    def start_participant(self):
        """ Participant initialization method. """

    def pre_train(self, dataset):
        """ Pre-trains the model. """

    def predict(self, item):
        """ Predicts a response to a syllogism. """

    def adapt(self, task, target):
        """ Adapt to the last response. """
```

○ CognitiveComputationLab/ccobra

```
$> cd ccobra-bench
$> python runner.py benchmarks/baseline.json mymodel.py
```

 CognitiveComputationLab/ccobra

Important Dates

- Oct 15th, 2018: Introductory Meeting
- Oct 24th, 2018: Registration Deadline (HisInOne)
- Oct 30th, 2018: Setup Meeting
- Dec 02nd, 2018: Deadline submission preliminary models
- Dec 03rd, 2018: Midterm presentation of preliminary results
- Jan 13th, 2019: Deadline for the written report
- Jan 19th-20th, 2019: Blockseminary

Workload & Expectations

- Use your time wisely (4 ECTS - 120h of work):
  - 10h Literature review
  - 40h First model (midterm)
  - 40h Model optimization (final)
  - 10h Presentation
  - 20h Written Report
- We expect you to have uploaded your models/files to the repositories until 11:59 PM on the respective dates
- Missing deadlines results in failing the seminar

For additional information, check our website

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https://www.cc.uni-freiburg.de/teaching/
predicting-cognition-via-machine-learning-ws-2018
```

In case of questions, ask now or send a mail later

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riestern@cs.uni-freiburg.de
elfleinl@cs.uni-freiburg.de
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