

UNIVERSITY OF CYPRUS**DEPARTMENT of COMPUTER SCIENCE****MAI646****Cognitive Programming for Human-centric AI****Research Study Assignments**

The purpose of these Assignments is to study in more depth some of the topics that are related to and important for Cognitive Programming and the development of Cognitive Assistants.

These assignments can be carried out alone or in a group of two students.

Topics of Study

Here is an initial list of topics for study. This list could grow as we progress in the course. Students can also suggest their own topics to be approved.

1. Ethical Design of AI Systems

First Refs

https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=60419

EU documents on AI Ethics

<https://www.bookdepository.com/Stoic-Ethics-Normative-Impact-Technology-on-Wellbeing-Edward-Spence/9781786615916>

“Stoic Philosophy and the Control Problem of AI Technology” by E. Spence, 2021

<https://www.computer.org/csdl/magazine/co/2017/05/mco2017050116/13rRUB7a1jt>

“Why Artificial Intelligence is a Matter of Design” by Andreas Theodorou

2. Explainability in AI

First Refs

<https://arxiv.org/pdf/1802.01933.pdf>



3. Cognitive Structure of Knowledge/Context and Cognition

First Refs

(https://doi.org/10.1007/978-1-4419-1428-6_2071

2012) Cognitive Structure. In: Seel N.M. (eds) Encyclopedia of the Sciences of Learning. Springer, Boston, MA.

http://openscience.fr/IMG/pdf/iste_muc19v3n1_1.pdf

https://link.springer.com/chapter/10.1007/978-3-319-57837-8_48

Contextual Reasoning in Human Cognition and its Implications for Artificial Intelligence Systems

4. The Psychology of Persuasion and Argumentation

First Refs

<https://www.istc.cnr.it/en/content/psychology-argument-cognitive-approaches-argumentation-and-persuasion>

5. Behaviour Economics and Human Decision Making

First Refs

https://books.google.com.cy/books/about/Nudge.html?id=mzZV9jFLltwC&redir_esc=y

6. Neural-Symbolic Integration

First Refs

<https://research.samsung.com/news/-When-deep-learning-meets-logic-a-three-days-virtual-workshop-on-neural-symbolic-integration-sponsored-by-Samsung-Research>

"When Deep Learning Meets Logic" virtual workshop, 15-17

February 2021. Leslie Valiant, Balder ten Cate, Ryan Riegel, Christos Papadimitriou

DAX: Deep Argumentative eXplanation for Neural Networks

<https://arxiv.org/pdf/2012.05766.pdf>

Neural-Symbolic Argumentation Mining: an Argument in Favor of Deep Learning and Reasoning

<https://arxiv.org/ftp/arxiv/papers/1905/1905.09103.pdf>

Study and Submission

Assignments will follow these steps:

1. Topic selection.
2. Schedule for submission finalized between the groups.

3. Get approval/guidance on the bibliography that you have chosen.
4. Submit on your submission dates a short report (circa 15 pages) that includes:
 - a. An overview of the topic
 - b. Its links to Cognitive Systems
5. Prepare a short presentation (15 slides) and upload your report.
6. Present on your submission dates your study to the class: 20 minutes for the presentation with 15 minutes discussion with the class.

