

Topics for Diploma and M.Sc. dissertations

The topics for diploma (πτυχιακή) and M.Sc. dissertations (διπλωματική) that my group can supervise fall into the following categories.

Semantic Web and Linked Data Technologies (especially for geospatial information)

For an introduction to this topic, see the slides of my postgraduate course Knowledge Technologies (<http://cgi.di.uoa.gr/~pms509/lectures.htm>). If you are interested in this topic, you will have to read some of the slides of the course, do a few programming exercises that we will mark, and then start your dissertation. You could work on one of the topics of the following papers:

- <https://arxiv.org/pdf/2007.07060.pdf>
- http://cgi.di.uoa.gr/~koubarak/publications/2019/yago2geo_iswc2019.pdf
- <http://cgi.di.uoa.gr/~koubarak/publications/2021/GeospatialInterlinking.pdf>

Deep Learning for Natural Language Processing

For an introduction to this topic, see the slides of my course Artificial Intelligence II (<https://eclass.uoa.gr/courses/DI517/>). If you are interested in this topic, you need to have completed the course already with a mark greater than equal to 8/10. You could work on one of the topics of the following papers:

- <https://arxiv.org/pdf/2008.12014.pdf>
- <https://arxiv.org/pdf/2004.13637.pdf>
- <https://openreview.net/pdf?id=ee6W5UgQLa>
- <https://www.amazon.science/publications/x-bert-extreme-multi-label-text-classification-usingbidirectional-encoder-representations-from-transformers>
- <https://www.ijcai.org/Proceedings/2020/0537.pdf>
- <https://arxiv.org/pdf/2012.13048.pdf>

Artificial Intelligence and the Law

For an introduction to this topic, see the following two papers:

- <http://cgi.di.uoa.gr/~koubarak/publications/2018/jurix2018.pdf>
- <http://cgi.di.uoa.gr/~koubarak/publications/2018/nomothesia-linked-data.pdf>
- <https://aclanthology.org/2020.findings-emnlp.261.pdf>

Your topic will be related to these papers and our platform Nomothesia (<http://legislation.di.uoa.gr/>).

Design Interfaces for Visualization of Knowledge Graphs

The tool Sextant (<https://sextant.di.uoa.gr/>) currently allows users to visualize the results of GeoSPARQL queries as layers on a map. Having this functionality in mind we would like to build a new system that would work both as an API and provide a user interface, to allow the visualization of data from Knowledge Graphs. Such systems have various components both in front-end and back-end design so there are several topics in both categories.