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Call for Master Thesis
„Creating a Knowledge Graph for the
ZKM | Zentrum für Kunst und Medien"

(in German or English)

What is the topic?

The ZKM would like to strengthen its capabilities in Artificial Intelligence and Digitalization. Among other things, the ZKM plans to work in the long run on chatbots, which will be available for website visitors and exhibition visitors on site.

As basis for such a chatbot (and potential other software systems), a knowledge graph should be developed in the proposed Master thesis. Knowledge graphs have been established as an advanced database technology and have been used by major Internet companies, such as Google (see Google fact boxes and the Google Assistant) and Amazon (see Amazon Alexa). Also in the area of art centers and museums, first institutions have created or are currently creating knowledge graphs for their needs (see [1][2]). In this light, a knowledge graph for the ZKM should be created that will be partially publicly available and will be used as basis for various applications in the future.

The first part of the thesis will focus on the transformation of existing databases of the ZKM into a knowledge graph and to evaluate the coverage and accuracy of the knowledge graph with regard to the individual attributes. In a second step, entities should be linked to existing, freely available knowledge graphs, such as Wikidata and the German National Library catalogue. As far as time allows, first machine learning models based on the knowledge graph can be created to find similarities, differences, and analogies between artists, works of art, etc.

The thesis will be supervised by Dr. Michael Färber from KIT and Daniel Heiss from the ZKM.

What are the prerequisites?

- You study Informatik, Informationswirtschaft, Wirtschaftsinformatik, or something related.
- You have profound programming skills (e.g., in Python).
- You ideally have some knowledge and experience in Semantic Web technologies (RDF, SPARQL) and data mining/data science/knowledge discovery.

[1] https://link.springer.com/content/pdf/10.1007%2F978-3-030-00668-6_20.pdf
[2] https://link.springer.com/content/pdf/10.1007%2F978-3-319-43997-6_15.pdf

Keywords: knowledge graph, semantic web, databases, knowledge discovery, data management, linked data.

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