Bachelor Thesis

FIZ Karlsruhe
Leibniz Institute for Information Infrastructure

Image Recognition for the Exploration of Historical Photograph Collections

A thesis with a purpose: help us to bring more meaning into cultural heritage data

Historical collections of performing art are an important form of cultural heritage and need to be preserved and made accessible to users on the Web for exploration. Often however, the metadata available for a historical collection are too sparse to create meaningful exploration tools. The automated recognition of historical images (e.g. via object detection) can be utilized to enhance the variety and depth of the metadata associated to an image collection. Moreover, Knowledge Graphs (KG)
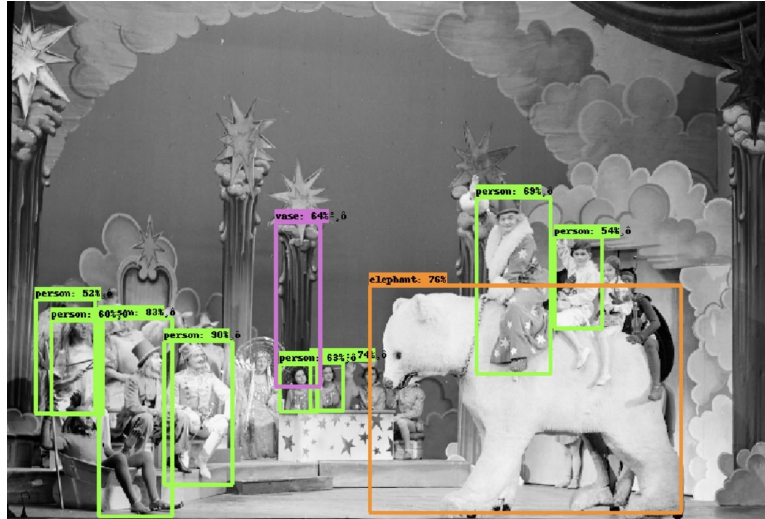
can be used to structure and interlink the generated image metadata to support data exploration and automated querying.

In this thesis, the challenges of deep learning based image recognition of historical photographs and the problems of data integration using KGs will be investigated. The use case for this thesis is Linked Stage Graph [1] which includes 7.000 historical theatre photographs. As a first step, the state-of-the-art of deep learning methods for image recognition will be investigated as part of a literature review. Then, existing and common deep neural network models are used to perform image recognition on the Linked Stage Graph photographs. The achieved results will be connected to external resources, e.g. Wikidata [2] or DBpedia [3] and integrated into the existing KG in order to be queried and explored.

This thesis will be supervised by **Prof. Dr. Harald Sack, Information Service Engineering at Institute AIFB, KIT, in collaboration with FIZ Karlsruhe**.

[1] http://slod.fiz-karlsruhe.de/
[2] https://www.wikidata.org/
[3] https://dbpedia.org

WIKIPEDIA
The Free Encyclopedia

Which prerequisites should you have?

- Good programming skills in Python
- Interest in Deep Learning technologies
- Interest in Machine Learning approaches
- Interest in Natural Language Processing
- Interest in Knowledge Graphs

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