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Object recognition in Illustrations in historical books:
Challenges and Evaluation

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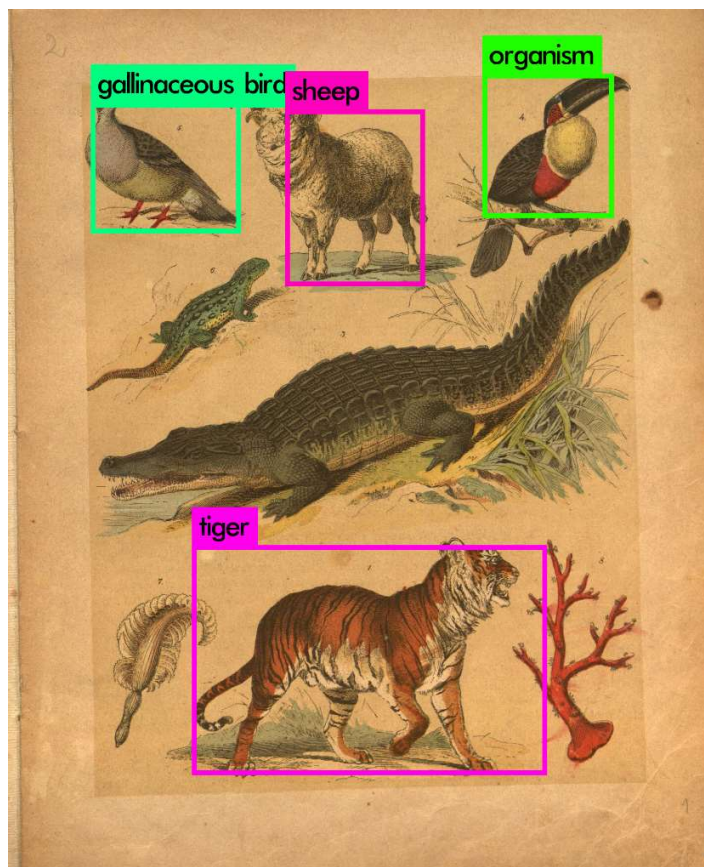
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Most discourse on historical children's and youth literature is based on text analysis and on traditional image interpretation. Although several digitalized collections of children's and youth literature have been assembled, they have been rarely processed with methods and systems in Digital Humanties and even more rarely with automatic images analysis. Currently, there are still controversies within e.g. art history on whether digital support is an adequate extension of the disciplines in the humanities.

Modern object recognition systems based on deep learning methods are an excellent opportunity to develop quantitative research on motif history. Systems like Yolo and SSD can be used. Progress in object recognition in images has been mainly achieved with collections of photographs.

Digitized collections of historical children's and youth literature from the 19th century pose new challenges for algorithms. For example, animals are often displayed in didactical positions which are unnatural. A bat can be shown with stretched wings. The proportions between animals on one page are not always realistic, but rather influenced by page layout. In such a situation, the implicit knowledge of a classification system could fail.

For experiments, we applied a pre-trained model of Yolo for some 9000 classes to the images from children's and youth literature. Within 1891 images from 16.000 pages from 168 books (from the collection of the collector Hobrecker at the library of the Technical University of

Braunschweig), Yolo found 4600 objects from 200 classes. The most frequent classes seem plausible hits: person, organism, artifact.

Example for Yolo results for an image in *Aus allen Zonen, wo Thiere wohnen! Ein lehrreiches Bilderbuch für brave Kinder. Reutlingen, [1883]. Ensslin & Laiblin. urn:nbn:de:gbv:084-18903*

For image processing in Digital Humanities, methods for processing and evaluation without intensive labeling need to be developed in order to allow the comparison on algorithms. An important question will be how the domain transfer from photographs to illustrations can be achieved by additional training or transfer learning.