An Interface for Art Historical Research

Prof. Dr. Björn Ommer (computer science)
ommer@uni-heidelberg.de

Dr. Sabine Lang (art history)
sabine.lang@iwr.uni-heidelberg.de

Computer Vision Group
HCI / IWR, University of Heidelberg
Berliner Strasse 43
69120 Heidelberg, Germany
What do art historians do?

- study production processes
- find visual similarities
- formal analysis
- classification
- semantic analysis
- context study
- provenance research
Working interdisciplinary in the Computer Vision Group of Heidelberg University

- interdisciplinary project
- embedded within both departments (art history and computer science)
- close work environment > allows for direct feedback
- formulate research questions together

An Interface for Art Historical Research

Dr. Sabine Lang

sabine.lang@iwr.uni-heidelberg.de
Can computers propel the understanding and reconstruction of drawing processes?

Central questions
(1) Are transformations due to technical peculiarities or the artist’s interpretation?
(2) What statements can be made about the reproduction process?

Computer Vision Group
International Conference on Image Processing (IEEE), 2011

An Interface for Art Historical Research
Dr. Sabine Lang
sabine.lang@iwr.uni-heidelberg.de
Identifying the temporal order

Identifying proportional modifications

(Source)

Codex Manesse (1305-1340) and its reproductions from the 18th century
Can computers help with the analysis of large image corpora, e.g. find gestures?

Central questions

(1) Which gestures can we identify?
(2) Do there exist varying types of one gesture?

(Detail) Sachsenspiegel (c1220)
Heidelberg version

Computer Vision Group
International Conference on Image Processing (IEEE), 2011

study production processes
find visual similarities
formal analysis
classification
semantic analysis
context study
provenance research

(a) pointing (b) swearing (c) speaking-b (d) speaking-f
subset of representatives for pointing gestures

contour responses

Relative position of a gesture

owner of gesture

reference object

reference gesture

owner of gesture

speaking

An Interface for Art Historical Research

Dr. Sabine Lang

sabine.lang@iwr.uni-heidelberg.de
An Interface for Art Historical Research
Dr. Sabine Lang
sabine.lang@iwr.uni-heidelberg.de

Interface for art historical research

study production processes
find visual similarities
formal analysis
classification
semantic analysis
context study
provenance research

http://compvis10.iwr.uni-heidelberg.de/menu.php

Interface; start screen, data collection Sachsenspiegel (c1220)
Interface

Data collection

Sachsenspiegel (c1220)
Search example within the *Sachsenspiegel* (c1220)

Example shows two bounding boxes (green)

Search results based on selected bounding boxes
User feedback for retraining the model: positive results marked green, negatives red
Algorithmic basis for art historical projects

Unsupervised Video Understanding by Reconciliation of Posture Similarities (2017)
International Conference on Computer Vision (ICCV)

CliqueCNN: Deep Unsupervised Exemplar Learning (2016)
Conference on Advances in Neural Information Processing Systems (NIPS)
Future questions

(1) What other tasks of art historical research can be tackled and how?
(2) What is still missing regarding tools, abilities of researchers and infrastructure?
(3) How does a collaboration between the two disciplines change existing research methods?
(4) How do we envision digital humanities to look in the future?

study production processes
find visual similarities
formal analysis
classification
semantic analysis
context study
provenance research
Further information & collaborators

https://hciweb.iwr.uni-heidelberg.de/compvis
https://hci.iwr.uni-heidelberg.de/publications-cv

Prof. Dr. Björn Ommer
(computer science)
ommer@uni-heidelberg.de

Dr. Sabine Lang
(art history)
sabine.lang@iwr.uni-heidelberg.de

Dr. Peter Bell
(art history)
bell@uni-heidelberg.de