

Images at the crossroads between computer vision and the human and social sciences

An inter- and transdisciplinary project of drawings of gods

¹Christelle Cocco, ¹Olga Serbaeva, ²Frédéric Darbellay, ¹Dominique Vinck, ¹Zhargalma Dandarova Robert, ¹Pierre-Yves Brandt

¹University of Lausanne, ²University of Geneva, Switzerland

Framework

“Drawings of gods: A Multicultural and Interdisciplinary Approach to Children’s Representations of Supernatural Agents”

- a large-scale program of inter- and transdisciplinary research taking various forms of collaboration amongst and across disciplines
- primarily rooted in developmental psychology and psychology of religion, today the project integrates cognitive science, cultural psychology, religious studies, theology, cultural anthropology, history of religious art, sociology and computer sciences to gain more insight into the complexity and diversity of children’s representations of supernatural agents

Aims of the project

- to discern broad trends and highlight patterns in children’s representations of supernatural agents and to gain more insight into their complexity and diversity
- to provide new information on how children acquire religious concepts both in religious and non-religious environments and to question the role of images and visual communication in transmission of religious traditions as well as the origins and development of religious symbolic thinking
- to contribute to the lack of research in culture and interfaith variation of children’s representations of supernatural agents

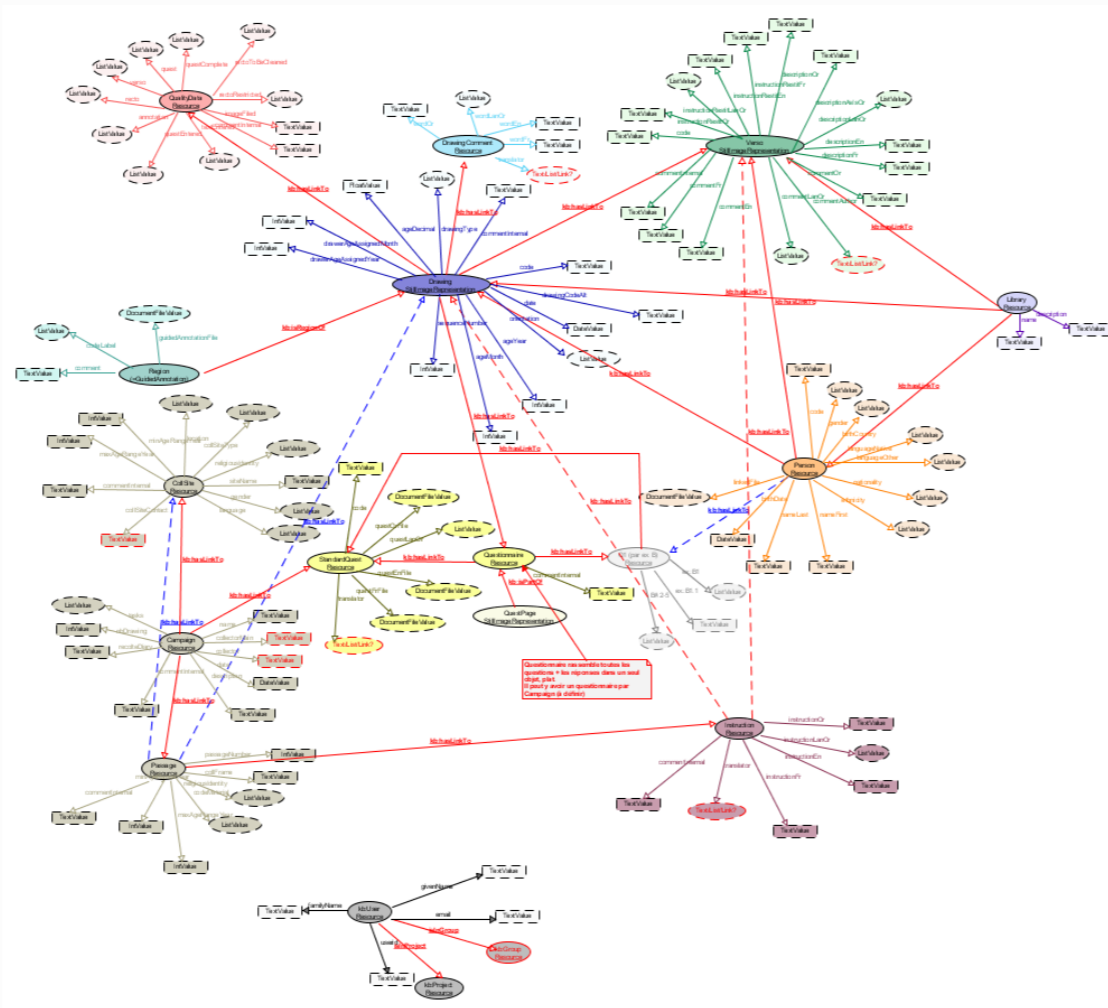
Digital humanities

- Three type of digital tools were developed according to the aims of the project: *a database, an annotation tool, and computer vision and image processing tools.*
- One of the main challenges of the project is a need to think, test, rethink and rework the created digital tools according to specific needs of this interdisciplinary project and the unique character of children’s drawings.
- This requires considerable time investment, financial resources and new skills on the part of all researchers.
- Finally, the digital considerably influenced on the research practices of humanities scholars.

Database

Drawings of gods Web-Based Database (<https://ddd.unil.ch/>)

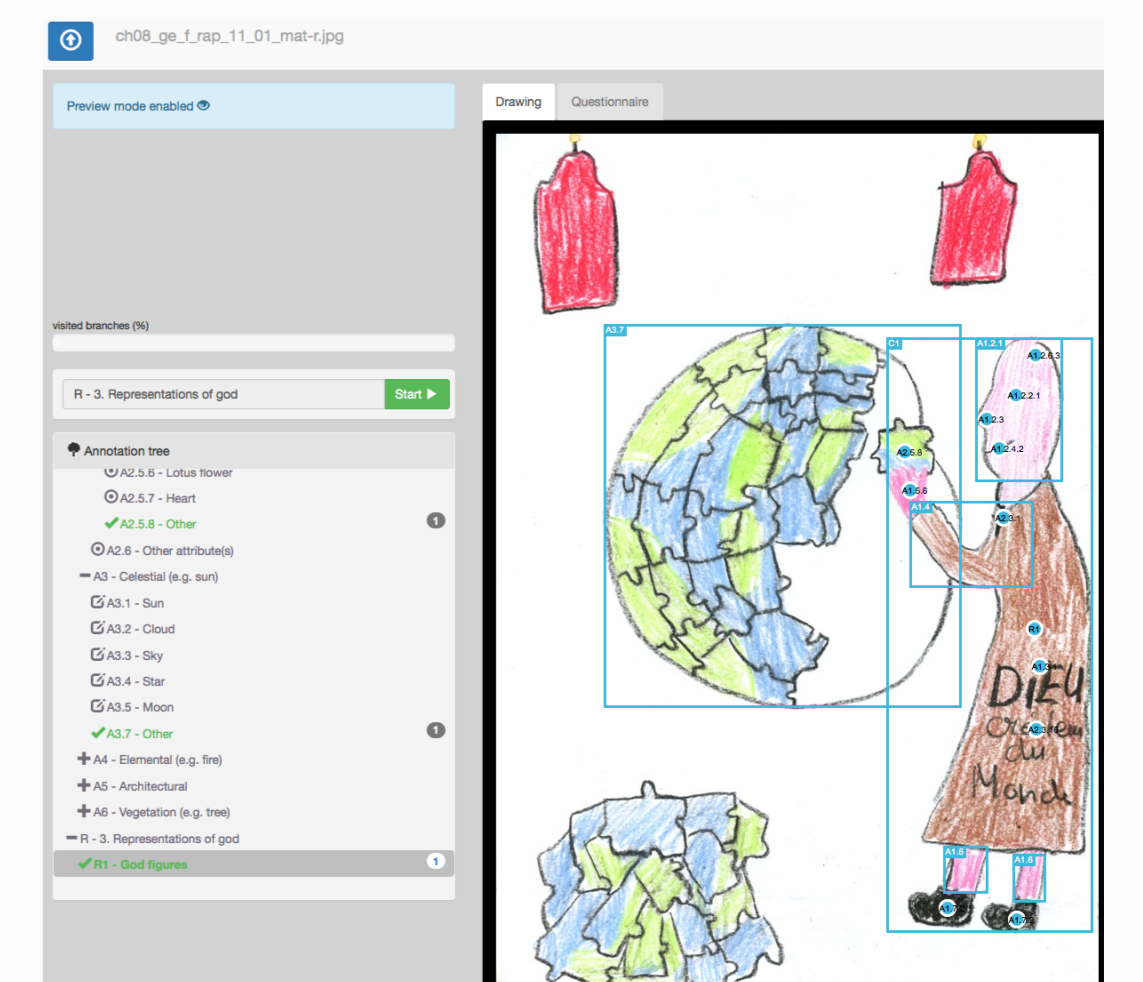
- designed to store research data (drawings, children’s descriptions of their drawings, questionnaires)
- currently contains more than 6’500 drawings collected in nine countries
- developed in collaboration with different partners (PlaTec at UNIL)
- two migrations due to constantly growing data and to correspond expanding needs of research: FileMaker Pro → PHP/MySQL → Knora/Salsah
- available to scholars affiliated with the project and to the broader public



Annotation tool

Drawing Annotation Interface *Gauntlet* (<https://d2d.vital-it.ch>)

- developed specifically for the project
- automated data processing is necessary to assess thousands of drawings despite their very complex nature
- common work of psychologists and bioinformatics specialists (SIB/Vital-IT DH projects)
- provides researchers with common semantics from a set of predefined features displayed along a hierarchical tree
- allows the extraction of geometric information (i.e., location, surface) on any annotation

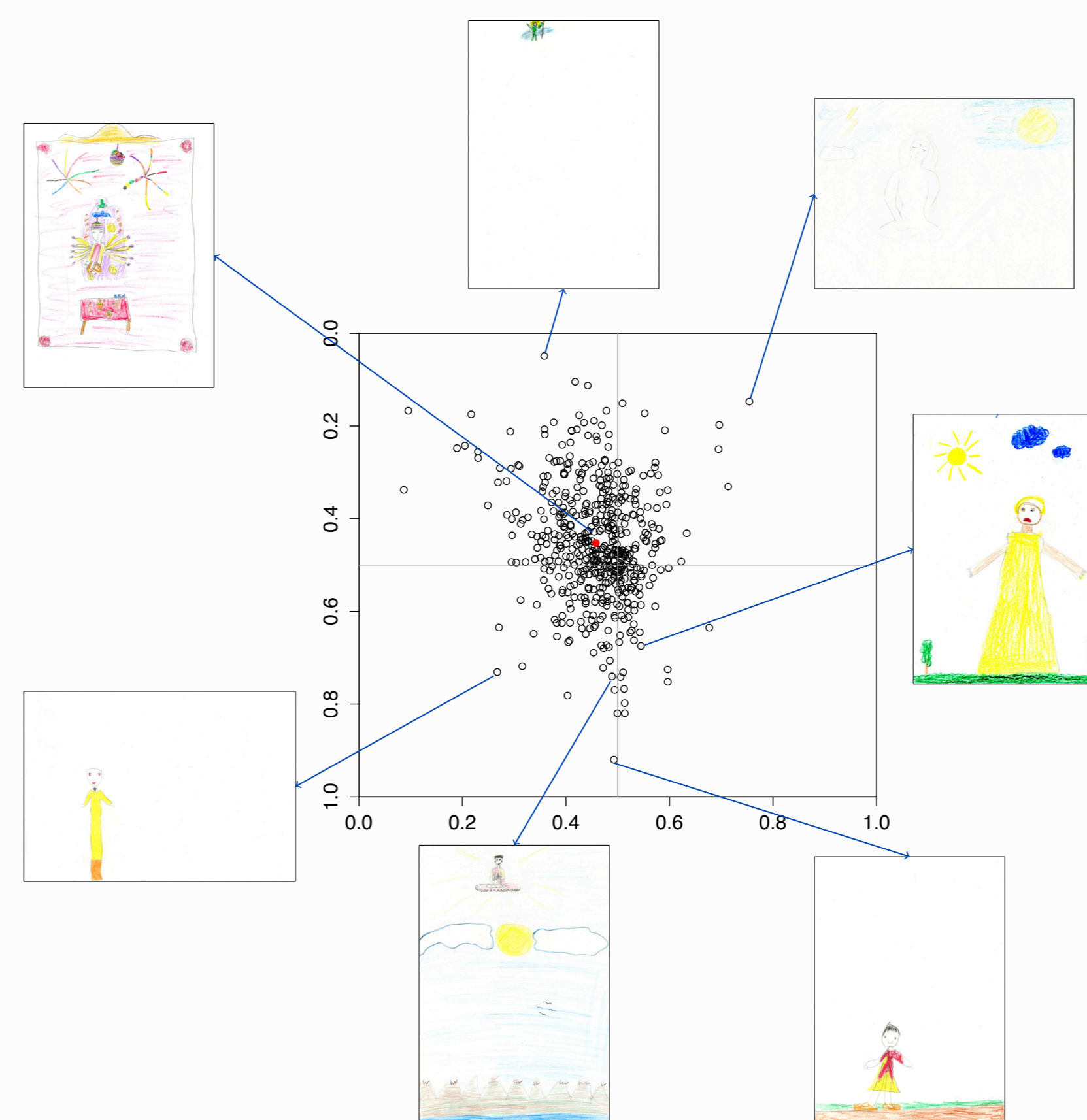


Computer vision and image processing

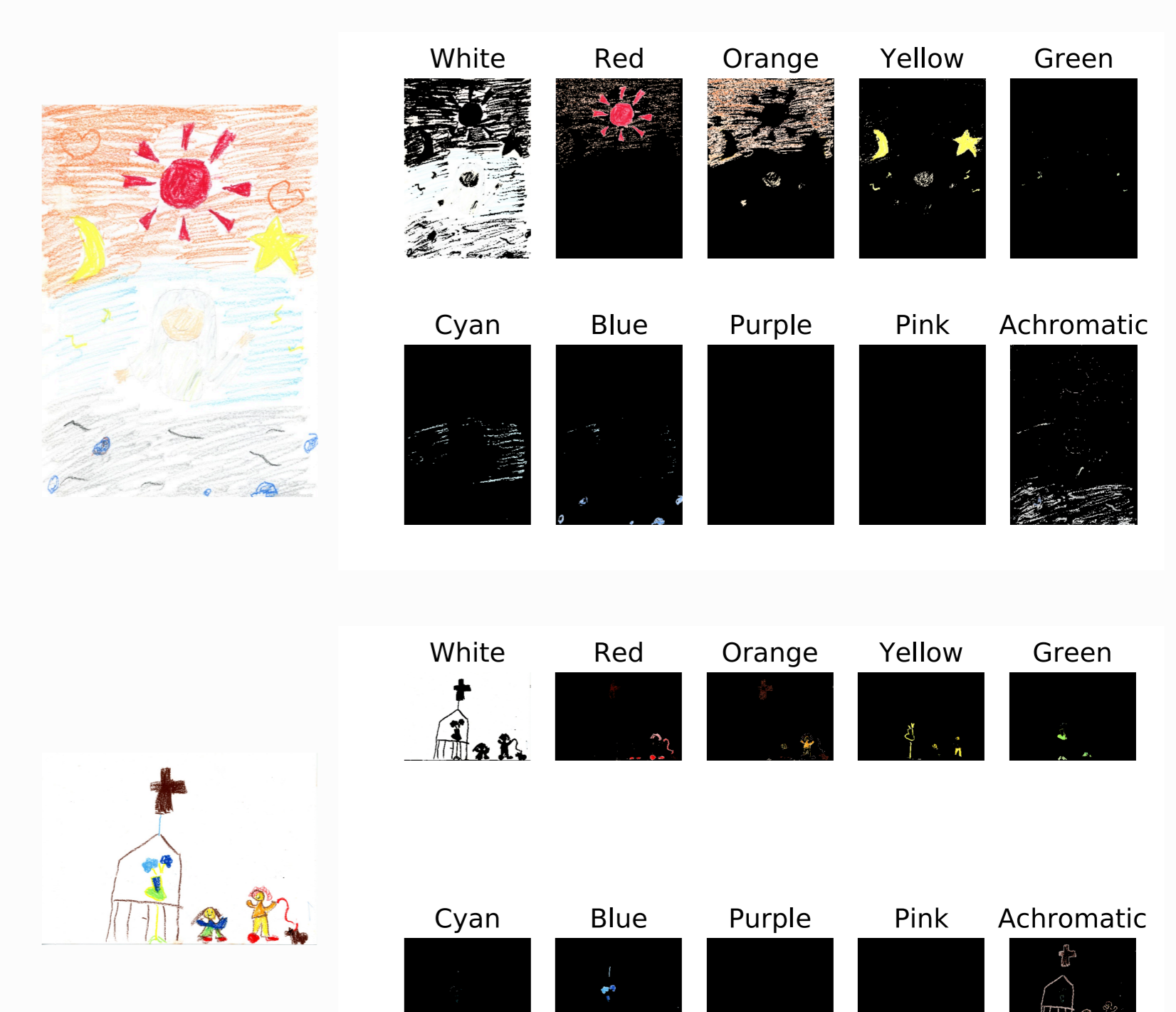
To deal with a large amount of drawings we developed automated analysis tools, for instance to identify colours and to compute the gravity center of an image.

- task was challenging due to the unique character of children’s drawings and since there are no similar studies on drawings
- first development was done in collaboration with IVRL - EPFL
- need to standardize the digitization of drawings: many drawings have been re-scanned and some others will have to be re-scanned
- final tools are a compromise between technical possibilities, financial and human resources, and initial research objectives

Gravity center for Russian drawings



Colour identification for a Japanese and a Swiss drawing



References

- Cocco, C., Dessart, G., Serbaeva, O., Brandt, P.-Y., Vinck, D., and Darbellay, F. (2018). Potentialités et difficultés d’un projet en humanités numériques (dh): confrontation aux outils et réorientations de recherche. *Digital Humanities Quarterly*, 12(1). <http://www.digitalhumanities.org/dhq/vol/12/1/000359/000359.html>.
- Dandarova Robert, Z., Dessart, G., Serbaeva, O., Puzdriac, C., Khodayarifard, M., Zardkhaneh, S. A., Zandi, S., Petanova, E., Ladd, K. L., and Brandt, P.-Y. (2016). A web-based database for drawings of gods. *Archive for the Psychology of Religion*, 38(3):345-352.
- Darbellay, F., Vinck, D., Cocco, C., Dessart, G., Dandarova, Z., and Brandt, P.-Y. (2018). L’interdisciplinarité en partage : collaborer pour innover. Le projet “Dessins de dieux”. *Innovatio*, (5). <http://innovacs-innovatio.upmf-grenoble.fr/index.php?id=437>.

Information

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Database: <https://ddd.unil.ch/>
Email: Christelle.Cocco@unil.ch