

Semantic Annotation for Medieval Cartography: The Example of the Behaim Globe of 1492

The Behaim Globe of 1492 is the oldest extant globe of the earth. It is an early masterpiece of different scientific and technological achievements; nowadays it is a famous exhibit of the German National Museum in Nuremberg. Its map image is primarily Ptolemaic, including elements of medieval universal cartography and of portulans. Its luxurious decoration shows 100 pictorial illustrations plus sixty banners and coats of arms, more than 2000 place names, and more than 50 long legends. The Behaim Globe is one of the very few existing cartographical works where different traditions of mapmaking are bound together: there are also elements of medieval universal cartography and of portulans.

Starting with a database of digital images of its surface, a comprehensive catalogue of all visually relevant places including text fields is built up by means of a domain ontology for medieval cartography in description logics (OWL-DL). Up to now, nearly 3000 instances (catalogue entries) have been created. Today it is a common practice to unite generic concepts and properties for objects, time and space, events, actors, processes, etc., in a reference ontology such that domain specific concepts are derived from the generic ones. The CIDOC CRM is such a reference ontology; our implementation, the Erlangen CRM/OWL, provides a semantic base for the cartographic domain ontology, suitable for automatic reasoning.

Furthermore, the globe provides georeferential organization of information which opens up a new dimension for semantic indexing. Historical maps are cognitive maps in the first place, which require a formal qualitative representation of (abstract) regions, their relative positions, but also direction, orientation, and distance. Represented by specific datatypes with constraint solvers, their integration with a logical representation framework leads to a system of hybrid reasoning for processing complex spatial queries over the Behaim globe instance base.

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