Doctoral School of Information and Biomedical Technologies Polish Academy of Sciences

Subject
Visual Knowledge Representation

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Project Description

For many years researchers have been intensively striving to describe image semantics. It is an element of a widely understood knowledge representation for further knowledge retrieval. So far, all knowledge has been represented in language form, in the beginning artificial, and now more or less natural which, at the same time, is the biggest obstacle in the proliferation of the knowledge repository. The best example is Wikipedia, without detracting from its merit, where articles differ depending on the national versions.

In the recent years, we have developed the data and information retrieval systems. It means that the decision maker has received raw, or slightly processed, mainly aggregated data. Recently, content-based image retrieval systems [1] have caused a great breakthrough in information analysis, becoming the front-end element in the domain of knowledge retrieval systems [2].

With a deluge of images and photos, and the development of graphical interfaces in computers, mobiles, etc., the new generation is more and more dependent on visual information rather than textual. It concerns not only human-machine interaction systems but, first of all, pattern recognition and machine learning, as well as artificial intelligence. All this suggests that we should construct a visual knowledge representation system, rather than textual ones, e.g. domain ontologies [3]. Our objective is the creation of a visual knowledge representation as the first step to a visual knowledge retrieval system because effective retrieval is possible only when a proper representation has been prepared. The most important factor in building a semantic representation is defining the ordered and hierarchical structure, as well as the relationships among entities. This concept has stemmed from the content-based image retrieval analysis.

As a matter of fact, we cannot totally avoid description in knowledge representation, but a concept of knowledge representation, focused on images as much as possible has been developing in the SRI PAS [4]. Images and, broadly understood, multimedia have such a large information potential that we can reduce the use of a natural language to nearly zero and, thanks to this, make our system much more universal.

Bibliography

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