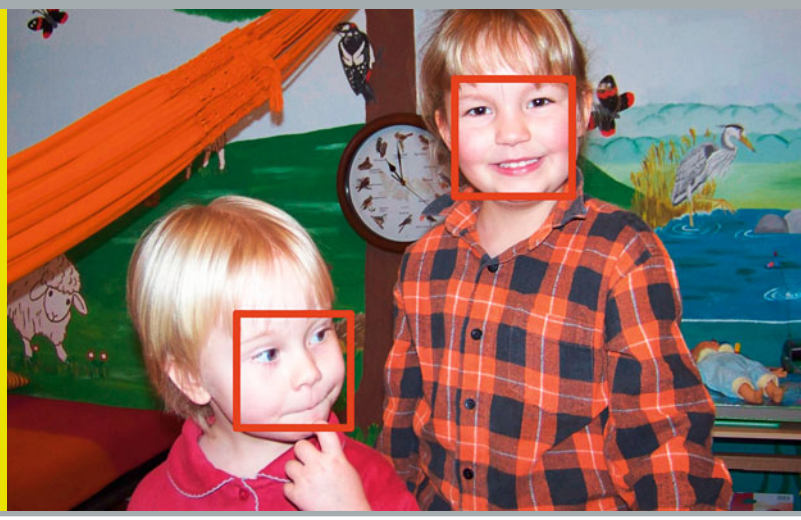
Fraunhofer
Heinrich Hertz Institute

Efficient Image Retrieval

Content-based Image Retrieval and Face Detection in Digital Media



On-target searches for images and their administration and organization is complicated and time-consuming. In the framework of the THESEUS research project – New Technologies for the Internet of Services – the Fraunhofer Heinrich Hertz Institute is developing highly efficient algorithms which deliver rapid and exact results for searches in complex image databases.

THESEUS
Neue Technologien für das Internet der Dienste

Bundesministerium für Wirtschaft und Technologie

Challenges

Exponential growth in the numbers of digital images calls for new strategies for picture retrieval and management. Implementation of a key-word-based search is time-consuming, and does not always lead to the desired results. Innovative techniques should be able to "anticipate" what the user is looking for. Informed by the natural patterns of selection of customers in a real world department store, intelligent search engines should mainly use visual descriptions, not text descriptions for searches and pre-selections.

The mission in the THESEUS research program is to develop innovative search algorithms that offer alternatives or complements to key-word-based searches.

Technical Background

The software for content-based image searches developed by Fraunhofer Heinrich Hertz Institute in the THESEUS research program consists of two modules – the analysis module and the search module.

The analysis module generates a metadata set for each image, based on algorithms developed by Heinrich Hertz Institute which enable extraction of picture characteristics like edges, colors and textures. The search module is trained using the metadata of one or a number of model images which thus makes it capable of using existing metadata to retrieve similar pictures. If a list of image metadata is input, it will be output ordered according to similarities with the image metadata the module has learned. The

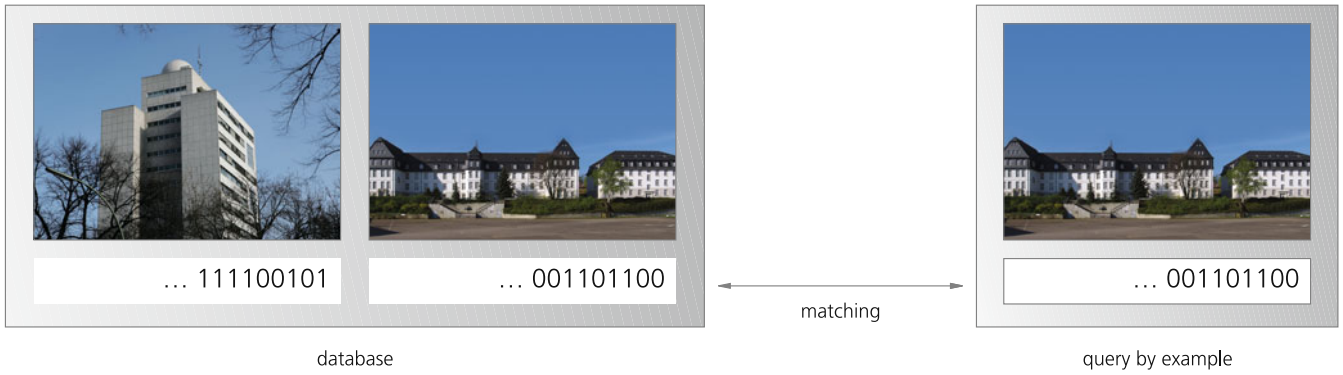


Image search

module for face detection checks on each individual photo to see how many faces it contains, where they are positioned in the photo and what size they are. This module has been specially developed to find faces in a variety of different positions and angles like facial profiles or the faces of people looking upwards or downwards. The module even operates flawlessly in various light conditions and under or overexposed photographs. Data about the faces retrieved serves for classification of photos such as portrait photos or group shots.

Benefits

- Similarity-based image search
- Creative search capabilities
- Retrieval of faces despite various positions and angles

CONTACT

Thomas Meiers

Interaktive Media – Human Factors
Fraunhofer Heinrich Hertz Institute
Einsteinufer 37 | 10587 Berlin | Germany

Phone +49 (0)30 31002-218
eMail thomas.meiers@hhi.fraunhofer.de
www.hhi.fraunhofer.de
www.imageretrieval-hhi.de
www.facedetection-hhi.de