Search technique for images recognises visual patterns

March 16 2005

Dutch researcher Mirela Tanase has developed a new technique for finding images using search engines. Her technique is based on how the human eye recognises objects. It can increase the success rate of certain search operations for objects from 10 to 70 percent.

Tanase developed two methods for decomposing objects into parts, which are then used to search for similar objects. The first method decomposes the interior of the shape. Humans find this task easy, but a computer often has problems working out how it should decompose an object. The second method works on a range of skeletons and decomposes the contour instead of the interior. Branching points in the skeleton provide an indication as to which pieces of the contour belong to perceptually different parts.

Subsequently Tanase developed a 'part-based' search engine. This finds images by using parts of objects. For example, for the image of a deer the engine can look for the legs of the deer. As well as images of a deer, the results found include other images containing similar contours, for example, elks, horses or elephants.

This search method provides a useful addition to the method chosen by MPEG7 to search contours. In certain cases where the MPEG7 method is relatively unsuccessful, the number of objects correctly found can increase from 10 to 70 percent.

Digitalisation

In recent years there has been an explosion in the number of digitalized photo collections made available to everyone via the Internet. Museums and art galleries are not the only parties involved. Hospitals also have databases with photos and many companies provide a detailed overview of their entire product range on the web.

Internet search engines such as Google work well for text files but are far less effective in searching for images. Due to the growing number of images in collections, there is an increasing need for good search methods. Searching using keywords is time-consuming and not always effective. Looking for visual information such as colour, texture and shapes found in the images, significantly increases the number of correctly identified objects in a search.

Source: Netherlands Organization for Scientific Research