

# New software 'teaches' computers how to identify beauty

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Beauty is no longer just in the eye of the beholder-computers "taught" to evaluate photographs can match people's aesthetic judgments of "beautiful" or "pretty" more than 70 percent of the time, according to Penn State researchers.

The researchers have developed a computational-aesthetics software that enables computers to single out aesthetically pleasing photographs based on more than a dozen visual features.

The software holds promise for Web users who, when searching for images, might want to hone in on what's "best" rather than browsing through thousands of returned images. It also has potential application for digital cameras. The software could inform photographers that they need to improve shot composition before they snap a picture, the researchers said.

"The software trains computers to judge photographs on 56 different visual features such as color saturation, exposure and composition," said James Wang, assistant professor in the College of Information Sciences and Technology (IST). "On average, if people think something is a 'good' picture, our computer thinks so, too."

The new software is described in a paper, "Studying Aesthetics in Photographic Images Using a Computational Approach," presented at the recent European Conference on Computer Vision in Graz, Austria. In addition to Wang, the other researchers involved in the project

include Ritendra Datta and Dhiraj Joshi, doctoral students at Penn State, and Jia Li, assistant professor of statistics.

Aesthetics or people's conceptions of beauty are generally considered highly subjective. But, while no single standard for beauty exists, certain visual features of photographs have been identified as generally pleasing. These include contrast, perspective and texture as well as color saturation, exposure and composition.

To develop their software, the researchers used more than 3,500 images found on an online photo-sharing community which has more than 400,000 registered members. The researchers took advantage of members' rating of photographs for aesthetics. The rating was based on a scale of one to seven.

For their project, the researchers selected images which had been ranked by at least two members and which had aesthetics scores greater than 5.8 or less than 4.2. Using those images and rankings, the researchers "trained" the computer to identify 15 features most often correlated to high aesthetic scores.

"These image-annotation techniques that we are developing have potential for additional uses for judging photographs but also for other applications such as biomedical image databases," Wang said.

"Computers, for instance, could be trained to classify pathologies."

Source: Penn State

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