Making Web videos more accessible to advertising:

The winner of McKinsey's Business Technology Award

A new system that automatically tags Web videos would make it easier for those videos to feature targeted advertising.

Markus Löffler

Since 2010, McKinsey's Business Technology Office has awarded a prize for outstanding scientific work that is innovative and has a clear practical application in the fields of business and technology. The contest, which is open to Austrian, German, and Swiss students, has two phases: first, scientific abstracts and other materials are submitted and evaluated, followed by a two-day judging round in which finalists present their work to a distinguished jury of practitioners and academics.

The 2011 winner, Damian Borth, calls the system he is developing "Lookapp for Ads"—a visual-concept-detection technology that employs automated multimedia analysis to detect semantic concepts including locations, objects, and actions that appear in Web videos. In 2010, Jella Pfeiffer won the prize. Her research examined decision-support systems, which are used, for instance, in online shopping. ○

For more information about the competition, which will award its 2012 prize in November, see bt-award.mckinsey.de. The site is available in German only.

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Automatically tagging Web videos

By Damian Borth

2011

While Web-based video services such as YouTube continue to grow rapidly, they face two interlinked challenges: granting efficient access to their vast content and stepping up their monetization of billions of weekly views. One important obstacle is that most contributors post their videos on the Web without adequate information describing their content. Services such as search and recommendation require annotations in the form of titles, tags, and descriptions. Unfortunately, the enormous volume of Web video and its rapid growth mean that it is not feasible to manually annotate untagged clips. One solution to this problem is concept detection that employs machine learning. Although less accurate than thoughtful human annotation, this approach improves access to video content and therefore attracts more viewers; in addition, it can better target ads to poorly tagged videos. For example, recognizing that a video shows a golf tournament would make it possible to target in-stream advertising for, say, golf equipment or books on the sport.

Such a system needs to be dynamic—once initiated, it should evolve and build new concept detectors by exploiting the virtually unlimited resources of common cloud-computing services. In academic prototypes, the creation of a concept vocabulary is usually narrowed down to the domain of the system, such as "news" or "sports," and is fixed during its life span. However, for a practical system to operate in the diverse and dynamic Web-video space, the concept vocabulary should be tailored over time. One way to do this is to discover trending topics by analyzing search patterns, access statistics, and real-time communication on social media. For a selected concept (for example, the UEFA Champions League tournament), the Lookapp system "trains" an automatic detector to recognize such footage by automatically "watching" properly tagged videos with this content on YouTube. Once able to detect concepts in weakly annotated videos, these concepts can be used as keywords in keyword-auction systems such as AdWords.

Damian Borth is a PhD candidate at the University of Kaiserslautern, Germany, and the German Research Center for Artificial Intelligence.

Helping online shoppers

By Jella Pfeiffer

2010

It is well-known that consumers apply different decision-making strategies throughout the selection process and hence need different kinds of support tools at different stages. Building on such findings, I designed a prototype consisting of a set of interactive information-management tools (IIMTs). The first step was to break down the decision strategies into the basic steps that require support. This enables IIMTs to be defined to more closely fit an individual's decision process. The result was an IIMT prototype, called INTACMATO. A theoretical analysis, specifying a decision maker's effort for each decision strategy with and without the support of INTACMATO, showed that the prototype effectively reduced the effort for various kinds

of decision-making behavior. Furthermore, an empirical study showed that increasing the number of IIMTs increases the perceived ease of use, usefulness, enjoyment, confidence, and satisfaction among users.

This research has useful implications for the design of Web stores and other decision-making interfaces. For instance, the results demonstrate that some IIMTs are useful for eliminating inferior alternatives quickly, while others are only appropriate for more in-depth comparison. As such, it would make sense for selection interfaces to distinguish between initial screening and in-depth comparison of alternatives.

Jella Pfeiffer is on the staff of Johannes Gutenberg University in Mainz, Germany, where she received her PhD in January 2011.