

*Developing Next-
Generation Visual
Search Engines*

**SHIH-FU
CHANG**

Professor of Electrical Engineering

Accurately searching through the glut of visual data available today - digital images produced daily in the thousands or millions - depends upon how closely your verbal description matches the words used to classify the image. It is a frustrating, time-consuming exercise that affects the general user as well as news, media, government and biomedicine specialists who crave a richer search and browsing experience. An automated visual matching and search technology would not only enhance classification and searching activities, but could also facilitate media forensics, helping to explain if an image has been manipulated, or if it is a natural photograph or computer graphic.

In order for a search engine to visually classify and find images, or determine if images have been tampered with, computers would need to perceive the abundant visual information provided by each individual image. All that data is much like DNA: thousands of genetic concepts of objects, people, scenes, events, and domain-related syntax that make up the individual image.

Shih-Fu Chang, professor of electrical engineering and director of the Digital Video and Multimedia (DVMM) lab at Columbia Engineering, targets his research on next generation search engines for digital images and videos, and has been influential in shaping the vibrant field of content-based multimedia retrieval. His group leads the University's ADVENT University-Industry Research consortium, promoting industrial collaborations with Columbia's research teams in the media technology area. In addition, his group has actively participated in the development of MPEG-7 and MPEG-21 international standards.

Ranked by Microsoft Academic Search as the most influential researcher in the field of multimedia, his research includes multimedia search, pattern recognition, media analytics, video adaptation and media forensics. Results include a ground-breaking search paradigm and prototype tools that allow users to find content of similar visual attributes, search videos by a very large pool of visual concept classifiers, and summarize the event patterns and anomalies found in a large collection of video content.

In 1998, he developed one of the first video object search systems, VideoQ, which supported automated spatio-temporal indexing at the object region level. His work has been broadly funded by government and industry and many video indexing technologies developed by his group have been licensed to companies.

Chang is a Fellow of the Institute of Electrical and Electronic Engineering (IEEE) and received the IEEE Kiyo Tomiyasu technical field award in 2009.

B.S., National Taiwan University, 1985; M.S., California (Berkeley), 1991; Ph.D., 1993

