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Computer and Information Sciences

Modeling Objects, Concepts, Aesthetics and Emotions in Images

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Abstract:
Automated annotation of digital pictures has been a highly challenging open research problem. In our work, by advancing statistical modeling and optimization techniques, we can train computers about hundreds of semantic concepts using example pictures. The ALIPR (Automatic Linguistic Indexing of Pictures - Real Time) system of automatic and high-speed annotation for online pictures has been constructed. Large collections of pictures from Internet photo-sharing sites, unrelated to the source of those pictures used in the training process have been tested. The experimental results show that a single computer processor can suggest annotation terms in real-time and with good accuracy. The talk will also introduce our related research efforts on modeling visual aesthetics and emotions. A comprehensive system has been developed to enhance the aesthetic quality of the photographs captured by the mobile consumers. The system, named OSCAR, has been designed to provide on-site composition and aesthetics feedback through retrieved examples.

Bio:
James Z. Wang has been on faculty at Penn State since 2000 where he is a Professor and the Chair of the College Faculty Council. Research interests of his group include automatic image tagging, semantics-sensitive image retrieval, image security, biomedical informatics, computational aesthetics, climate informatics, and art image analysis and retrieval. He has been a recipient of an NSF Career award and an endowed PNC Professorship provided by the PNC Foundation. He was a Visiting Professor at the Robotics Institute of Carnegie Mellon University from 2007 to 2008. He has served as the lead guest editor of IEEE Trans. on Pattern Analysis and Machine Intelligence. In 2011 and 2012, he served as a Program Manager in the Office of the National Science Foundation Director. He holds a summa cum laude Bachelor's degree in Mathematics and Computer Science from University of Minnesota and an M.S. in Mathematics, an M.S. in Computer Science, and a Ph.D. from Stanford University.