COMPUTER VISION DISTINGUISHED SPEAKER SERIES

School of Electrical Engineering & Computer Science
University of Central Florida

Visual Learning and Conceptualization

Pursuing Manifolds in the Universe of Images

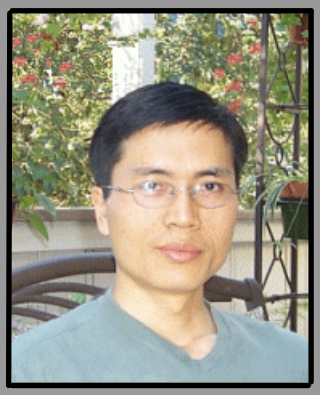
Dr. Song-Chun Zhu
University of California, Los Angeles

Images are very high dimensional signals and natural images are believed to reside in low dimensional manifolds that correspond to various visual patterns. But what are the structures of these manifolds? How are they related to each other in the universe of images? In this talk, I will present a unifying theory for learning probabilistic models by manifold pursuit. Firstly, I will show two types of pure manifolds: (i) implicit manifold for high entropy patterns, like texture, and (ii) explicit manifolds for low entropy patterns, like textons and image primitives. Secondly, I will show how they are mixed to form middle entropy patterns, like a cat face in an Active Basis model, and to generate a primal sketch representation conjectured by David Marr in his influential book. Thirdly, I will show how these manifolds are composed by a stochastic graph grammar to form object categories, such as clock, furniture, vehicles, for object category recognition.

4:00pm, March 26, 2008
Harris Engineering Center, Room 101
http://www.eecs.ucf.edu/~vision

Supported by the Dean of the College of Engineering and Computer Science.

BIOGRAPHY



Song-Chun Zhu is a professor of Statistics and Computer Science at UCLA. His research interest includes Computer Vision, Learning, the Interactions of Vision and Arts. He received a B.S. degree from University of Science and Technology of China, 1991, MS. and Ph.D degrees from Harvard University in 1994 and 1996 respectively (Ph.D. Advisor was Dr. David Mumford). He worked at Brown University, Stanford University, and Ohio State University before joining UCLA in 2002. He has co-authored more than 100 peer reviewed papers in computer vision, and received academic recognition including a David Marr Prize in 2003 for image parsing, twice Marr Prize honorary nominations in 1999 for texture modeling and 2007 for learning deformable templates. He is also a recipient of NSF Career award, ONR young investigator award, Sloan Research Fellow. In 2005, he founded an independent and non-profit organization – the Lotus Hill Research Institute in China as an open platform for international collaborations.