『清华信息大讲堂第99讲－三星第3讲』

报告题目： Network Analysis: Characterising structure, complexity and learning

报告人： Prof. Edwin Hancock

报告时间： 2013年3月21日（周四），下午3:00-4:30

报告地点： 中央主楼511会议室

摘　要：

This talk will focus on how graph-structures can be compactly characterised using measurements motivated by diffusion processes and random walks. It will commence by explaining the relationship between the heat equation on a graph, the spectrum of the Laplacian matrix (the degree matrix minus the weighted adjacency matrix) and the steady-state random walk. The talk will then focus in some depth on how the heat kernel, i.e. the solution of the heat equation, can be used to characterize graph structure in a compact way. One of the important steps here is to show that the zeta function is the moment generating functions of the heat kernel trace, and that the zeta function is determined by the distribution of paths and the number of spanning trees in a graph. We will then explore a number of applications of these ideas in image analysis and computer vision.

简　介：

Edwin R. Hancock holds a BSc degree in physics (1977), a PhD degree in high-energy physics (1981) and a D.Sc. degree (2008) from the University of Durham. From 1981-1991 he worked as a researcher in the fields of high-energy nuclear physics and pattern recognition at the Rutherford-Appleton Laboratory (now the Central Research Laboratory of the Research Councils). During this period, he also held adjunct teaching posts at the University of Surrey and the Open University. In 1991, he moved to the University of York as a lecturer in the Department of Computer Science, where he has held a chair in Computer Vision since 1998. He leads a group of some 25 faculty, research staff, and PhD students working in the areas of computer vision and pattern recognition. His main research interests are in the use of optimization and probabilistic methods for high and intermediate level vision. He is also interested in the methodology of structural and statistical and pattern recognition. He is currently working on graph matching, shape-from-X, image databases, and statistical learning theory. His work has found applications in areas such as radar terrain analysis, seismic section analysis, remote sensing, and medical imaging. He has published about 135 journal papers and 500 refereed conference publications. He was awarded the Pattern Recognition Society medal in 1991 and an outstanding paper award in 1997 by the journal Pattern Recognition. He has also received best paper prizes at CAIP 2001, ACCV 2002, ICPR 2006 and BMVC 2007. In 2009 he was awarded a Royal Society Wolfson Research Merit Award. In 1998, he became a fellow of the International Association for Pattern Recognition. He is also a fellow of the Institute of Physics, the Institute of Engineering and Technology, and the British Computer Society. He has been a member of the editorial boards of the journals IEEE Transactions on Pattern Analysis and Machine Intelligence, Pattern Recognition, Computer Vision and Image Understanding, and Image and Vision Computing. In 2006, he was appointed as the founding editor-in-chief of the IET Computer Vision Journal. He has been conference chair for BMVC 1994, Track Chair for ICPR 2004 and Area Chair at ECCV 2006 and CVPR 2008, and in 1997 established the EMMCVPR workshop series.

主办单位：信息学院

联系人：周杰　jzhou@tsinghua.edu.cn