上海交通大学 Shanghai JiaoTong University

电子信息与电气工程学院 School of Electronic, Information and Electrical Engineering

学 术 报 告 会

Seminar Announcement

题　　目：**Visual surface representation as the key to unsupervised learning in deep networks**

日　　期：**2017-5-22 上午 09:30-12:00**

地　　址：**电院3号楼200号多功能报告厅**

报 告 人：**TIENREN TSAO**

Abstract:

In recent years, deep artificial neural networks have completely changed the landscape in the field of pattern recognition and brought great hope for solving longstanding computer vision problems. While the performance of deep networks can rival that of humans in certain situations, they are still greatly inferior to humans at many tasks such as object segmentation and tracking. A fundamental shortcoming of deep networks is that they depend on extremely large labeled training sets, while the human brain is able to learn new representations in an unsupervised way with access only to unlabeled sensory signals in the environment. We believe that the origin of this fundamental shortcoming of deep networks is that they are reducing the problem of vision to one of pattern recognition, and thereby skipping a key intermediate step: *visual surface representation*. In my talk, I will discuss why the lack of surface representation in current state-of-art deep networks is a critical deficiency, present a mathematical theory explaining how surface representation is likely the key step permitting unsupervised learning of visual representations, and show how this new mathematical understanding can be incorporated into a deep network architecture.

Bio :

Dr. Tienren Tsao has worked on the problem of computer vision for the last 30 years. Prior to founding OpticArray Technologies, he founded CompuSensor Technology Corporation, which did R&D on intelligent autonomous systems and sensor information extraction for numerous government agencies and companies including Sandia National Laboratories, the Department of Defense, Boeing, and Lockheed Martin. He has published numerous papers on computer vision and received the SPIE Kingslake Medal and Prize for his work on target tracking through rapid sensor orientation change. He earned his PhD in the Machine Intelligence and Pattern Analysis Laboratory at University of Maryland.