

北京大学信息工程学院

前沿学术讲座

2014年2月18日（星期二）下午 15:40—17:00 H 栋 214 会议室

Topic: Visual Robot Navigation: Mapping and Localization with Images

Speaker: Prof. Hong Zhang, University of Alberta, Canada



加拿大 University of Alberta 计算机系资深终身教授、加拿大 NSERC（国家科学与工程研究委员会）智能传感系统首席资深工业研究主席。

IEEE Transactions on Systems Man and Cybernetics, Part B 副主编、International Journal of Humanoid Robotics 等期刊的编委。曾担任 2002 年 VI 国际会议项目合作主席；2005 年 IEEE/RSJ IROS 程序委员会主席；2006 年 IEEE ROBOTICS 国际会议总主席；2010 年 IEEE ICRA 国际会议总主席；2012 年 IEEE ROBOTICS 国际会议总主席。获 IEEE 千禧奖章。2002 年 University of Alberta 理学院首届最佳教师奖，张宏教授的研究领域包括机器人控制、传感、机器视觉与图像处理、仿生群体机器人、SLAM（同时定位与地图构建）、基于视觉的机器人导航等。

Abstract: Autonomous robot navigation represents an important field of research in robotics. Many recent research efforts in this field have focused on the use of vision as a primary sensing modality for acquiring information about a robot's environment. In particular, a popular and efficient method of map representation, known as appearance-based map, uses captured images to describe locations of interest and the temporal and spatial adjacency of the images to define the topological relationships between the locations. Image-based appearance SLAM provides an alternative to the landmark-based SLAM that has dominated SLAM research over the past 20 years. In this talk on appearance SLAM, I will discuss three specific issues in visual robot navigation with a single camera: (a) mapping through visual sampling of the environment (b) robot localization and loop closure detection using images, and (c) augmenting an appearance map with metric information. I will argue that central to the resolution of the first two issues are efficient and accurate algorithms for image comparison and matching. For introducing metric information to an appearance map, we resort to recent research in pose-graph SLAM.