Object Extraction, Classification, and Tracking of Objects in Wireless Multimedia Sensor Networks

Abstract: Wireless Multimedia Sensor Networks (WMSNs) are characterized by large number of resource constrained camera sensors. In remote surveillance applications, such resource constraints necessitate the design of lightweight solutions for traditional problems such as object localization and real-time tracking. In this presentation, I will first discuss an energy-efficient object localization and multiple object tracking scheme for WMSNs. The object localization is performed by individual camera sensors. For that purpose, the approach first extracts the detected object from the video frame and finds its boundary using frame differencing. The location of the object is then estimated with the help of the camera sensor’s location, distance of the object to the camera and camera/frame size properties. After localizing a detected object, its boundary information is used to perform a object classification at the camera sensor. In this way, without receiving the raw video data from the camera sensors, the sink can identify a specific object even though its information may come from several camera sensors at different times, and determine its path for the purpose of tracking. In this presentation I will also discuss some of the research issues related to object extraction, classification and tracking of objects in WMSNs.

Biography: Prof. Dr. Adnan Yazıcı is the chairman of Dept. of Computer Engineering, METU, Ankara-Turkey. He received his PhD in Computer Science from the Department of EECS at Tulane University, New Orleans, USA, in 1991. He was a visiting professor at Tulane between 1998 and 2000. His current research interests include intelligent database systems, fuzzy database modeling, indexing structures, spatio-temporal databases, multimedia and video databases, and wireless multimedia sensor networks. Prof. Dr. Adnan Yazıcı has published more than 180 international technical papers and co-authored two books, which are titled Fuzzy Database Modeling (by Springer) and Uncertainty Approaches for Spatial Data Modeling and Processing: a Decision Support Perspective (by Springer). He has received IBM Faculty Award for 2011 and Young Investigator Award bestowed by the Parlar Foundation, for the year 2001. Prof. Dr. Yazıcı was a Conference Co-Chair of the 23rd IEEE International Conference on Data Engineering (ICDE-2007), Conference Co-Chair of the 38th Very Large Data Bases (VLDB 2012), Program Co-Chair of Flexible Query Answering Systems (FQAS 2011) and Program Committee Chair of the 18th International Symposium of Computer and Information Sciences (ISCIS 2003), ISCI 2012 and ISCI 2013. He is the director of Multimedia Database Lab. in the Computer Engineering Department at METU.