

## *Session A : Sensor & Home Networks*

# **Mining Group Relationship in an Object Tracking Sensor Network**

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### **Biography**

Hsiao-Ping Tsai received her B.S. and M.S. degrees in Computer Science and Information Engineering Department in National Chiao Tung University in 1996 and 1998, respectively. She currently pursues the Ph.D. degree in Electrical Engineering from National Taiwan University, Taipei, Taiwan. She became a Student Member (M) of IEEE in 2002. Her research interests include network storage system, wireless sensor networks and data mining.

### **Abstract**

In the object tracking applications, previous works show that moving objects usually exhibit some degrees of regularity in their movement. Biologists find out that many creatures have social behavior that is they usually form mass organization and migrate together. In this paper, we investigate and utilize the characteristic of the group movement of objects to explore the group relationship in the wireless object tracking sensor network (OTSN). In contrast to the centralized mining, we propose a distributed mining algorithm to find a group of moving objects with similar moving patterns. Our algorithm consists of the local mining phase and the cluster ensembling phase. The local mining phase adopts the VMM model together with Probabilistic Suffix Tree (PST) to find the moving patterns, as well as Highly Connected Component (HCS) to partition the moving objects. The cluster ensembling phase utilizes Jaccard Similarity Coefficient and Normalized Mutual Information to combine and improve the local grouping results. The experiment results show that our distributed mining algorithm achieves good grouping quality and robustness.