

Multi-resident activity recognition using label combination approach in smart home environment

ABSTRACT

Activity recognition in smart home environment is becoming challenging when it is involving more than one resident living in the same space. It is not merely recognizing the activity performed nevertheless to track and identify the performer of specific activity also need to address in order to provide the great autonomous for ambient intelligence system (AmI). It is a challenging task due to diversity and complexity of sensor fusion that only using the binary data from single type technology of ambient sensors. Strong approach is needed to identify types of activities performed at the same time to track which resident are performing that particular activity. Previously, researchers build the multi-resident activity model regardless the performer, thus the data association also fails to tackle the problem applicably. This research presents the multi-label classification approach to recognize the activity at the same is able to track the resident in multi-resident in a smart home setting. It has been tested on the real smart home datasets using Label Combination method of multi-label classification technique using random forest as its base classifier. The Hamming score, accuracy and exact match are selected as evaluation metrics to measure the proposed solution.

Keyword: Activity recognition; Multi-resident; Smart home; Multi-label classification; Label combination