論 文 の 内 容 の 要 旨

論文題目　　　　　Autonomous Human Action Recognition based on a Novel
　　　　　　　　　Incremental Approach of Clustering
　　　　　　　　　（新しいインクリメンタル分類法を用いた人間行動の自律的認識
　　　　　　　　　法の研究)

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　Human activity support or assisted living systems are useful to address various
social needs in the modern society such as personal assistant and elderly care.
For such system to sensibly support us, it is useful for the systems to understand
what we are doing. Human Activity Recognition (HAR) is therefore an important
component in such systems. However, we have not seen wide adoption of HAR in our
homes. We identify that the main hurdles to wide adoption of HAR in our homes are
the expensive infrastructure requirement and the limitations in the HAR technology.
Many HAR researches have been carried out assuming an environment embedded with
sensors. In addition, the majority of HAR technologies use supervised approaches,
where there are labeled data to train an expert system. In reality, our natural
living environment is not embedded with sensors. Labeled data are not available
in our natural living environment. The training and labeling process are
inconvenient for users. Furthermore, there lack a framework for HAR in an
autonomous manner for our natural living environment.

　In this thesis, we have proposed a framework for autonomous Human Action
Recognition suitable in our natural living environment, i.e. the sensor-less homes.
The contributions of this thesis are:

- It enabled discovery of human actions in our natural living environment through an incremental approach of clustering.
- It developed a framework for autonomous Human Action Recognition incorporating a novel human action discovery technique
- It is the first study in the unsupervised approach of Human Action Recognition using data from low-cost depth sensor.
- The development of the autonomous Human Action Recognition framework will improve usability of HAR technologies in our homes.