

Stable Tag Identification in Mobile RFID Systems

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Abstract

With the advance of RFID technology, many mobile tag applications have been realized in our daily life. The applications may be a passenger who holds a RFID ticket to pass a gate on a MRT system or a car with RFID tag to pass a tollgate on a free way. In these applications, mobile tags move into an RFID reader field in a short period and then leave the reader field after they are successfully identified. These applications are all expected to serve fairly, that is, RFID tags are identified not only efficiently but also in sequence. From the RFID technology viewpoint, the fairness of this service is regarded as the order of tags recognized complies with the order of tags arriving. If these two orders are the same, the present research says that tag identification is in order stabilization, that is, stable. However, the issues of finding a metric to measure order stabilization and how to make mobile tags identification stable have not been explored in the existing mobile tag identification research. The present research, therefore, proposed the order stabilization degree as a metric to measure the order stabilization and proposed the Adaptive Binary Splitting with Order Stabilization (ABS-OS) method to recognize mobile tags. The present research, finally, evaluated the performance through simulations. The results showed that the performance of ABS-OS outperformed that of ABS.

Keyword : Adaptive Binary Splitting, Order Stabilization, Mobile Rfid Tag Identification