

A mobile RFID system for multi-object searching

Student : Chen-Yi Huang

Advisor : Dr. Chieh-Yuan Tsai

Institute of Industrial Engineering and Management

Yuan-Ze University

Abstract

At the beginning, RFID (Radio Frequency Identification) technology is mainly designed for object recognition. Recently, RFID devices are used to locate objects since it is relatively inexpensive when comparing with other positioning devices. In the past, most scholars focused themselves on how to use mobile RFID reader to locate a single object, and did not study the issue of how to find multi-object simultaneously. Therefore, this study attempts to construct a mobile RFID system for multi-object searching. In this study, a two stage searching method is proposed to identify objects and their location regions. In the first stage, the antenna which is equally effective in all directions in the mobile reader is used to detect object's annular range when changing reader's reading range. In second stage, the directional antenna in the mobile reader is used to judged object's sector region according to the received signal strength in each direction. The two-stage searching method will help user to reduce searching space. Next, based on four proposed strategies, the system will decide whether to put the identified objects into current picking list or not. The objects are not in the current picking list will be add into the later picking list when the mobile reader detects the object next time. When the current picking list is decided, the simulated annealing algorithm will arrange the visiting path with shorest

distance for the objects in the picking list. It is believed that the proposed system will help user to save time and reduce moving distance when conducting multi-object searching.

Key word: RFID、object positioning、path [suggestion](#)、Simulated Annealing Algorithm