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Abstract
The purpose of this research is to understand the readability of RFID actually applying to the books and to find out its most suitable situation for the books. We label the ultra-high frequency(UHF) RFID tags on books to test the RFID readability. We consider the following factors: the distance, the angle between RFID reader and books, the thickness of books, the tag position on the book, and read many books simultaneously, etc. The experimental results show: (1)The situation of reading a single book: the farther the distance is, the worse the reading rate is. If the angle of the book is close to vertical from the reader, the result is better. There is no difference in the thickness of books within our test range. It is better when the direction in which the book is put to RFID reading device in parallel than in perpendicular. The position is best where the tag is labeled at the book's spine. When the book is perpendicular to the reading device, it is relatively good for the tag to be labeled on the side close to RFID reading device. When the book is parallel to the reading device, the tag stuck to the top has better readability. (2)The situation of reading multiple books at the same time: when the books are piled together, the more the books are, the worse the reading rate is. The tag on books parallel to RFID reading device has better readability. For tag position on books: when books are perpendicular to RFID reading device, the tag labeled on the side close to RFID reading device has better readability. When books are parallel to the reading device, the readability of the tag labeled to the down is relatively excellent. The book, on the top or on the bottom of a pile books, has better readability than in the middle books.
In according to our experiment, we suggest when reading single book, the best situation is that the tag labeled at the book's spine, the reading distance is within 80cms between the book and reader, the book is perpendicular to reader. In this situation, the book has 99% success readability. When reading multiple books at the same time, the best situation is that books are parallel to RFID reader, the tag labels book on the bottom of the book. The books closer to RFID reader is, the readability better is.
Advisory Committee Jensen Lin - advisor

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