

Master's Thesis

« Position Allocation of Wireless Devices »

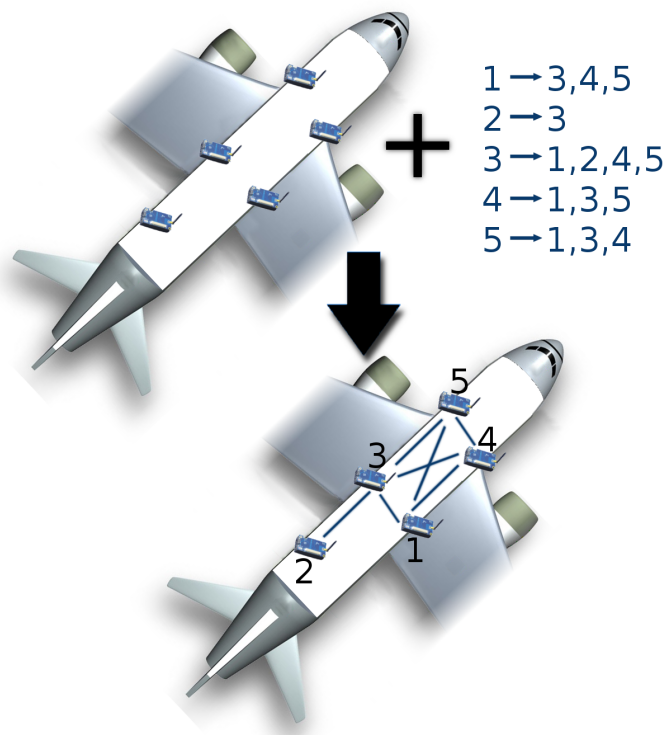
Background

The correct location of all the life vests in an aircraft has to be verified by an airline before each flight. To decrease costs, a determination of the positions using wireless technology is considered. For this purpose each life vest is equipped with a tiny wireless device broadcasting periodically its identification number. Current research shows, that a ranging and position detection of these nodes based on the received signal strength leads to inappropriate results due to the fact of multipath propagation in an aircraft cabin. An alternative approach is the usage of neighboring data, which is logged by each node via overhearing of the radio channel.

Although the expected position of the live vests in the cabin is known, mapping of the received identification numbers of the live vests to seat numbers is still a challenge. In this thesis techniques for solving this problem have to be developed using neighborhood information of the wireless devices.

Work description

The work is divided into two part: a theoretical and a practical. For the latter you have to implement a neighborhood exploration protocol for Crossbow's IRIS-platform. Thereafter a set of IRIS nodes is deployed in order to obtain neighborhood information for the devices. This empirical data will be the basis for your theoretical work. The neighborhood information must be used to map each node to its location. This task has some similarities to the problem of showing isomorphism of two given graphs. Currently different heuristic methods, as well as algorithms for specific classes of topologies exist and should be analyzed. You are also free to develop own algorithms.



Prerequisites

- Basic knowledge of Graph Theory and Discrete Mathematics
- Programming skills in the C language

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