

DEVELOPMENT OF AN IOT BASED VISITOR DETECTION SYSTEM

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In this paper, we propose system based on impulse radio ultra-wideband (IR-UWB) radar sensors for counting multiple people passing through a passage or a wide door. The proposed counting system utilizes two IR-UWB radar sensors equipped with antennas which have narrow beam width to form two invisible electronic layers in the path. The two electronic layers are used for sensing and direction recognition of multiple people passing by. Algorithmically, sensing and direction recognition of a person passing through a path are performed considering both information of a received signal in each radar and mutual information between two radar signals. The proposed counting system is implemented with two radar modules designed using commercial radar ICs and a Raspberry Pi 2 modules. We installed the designed modules in the subway station to verify the performance. Based on the installed modules, data were acquired for one week and the counting performance was verified for various time intervals such as 2 minutes, 1 hour, and 1 day. Except for a few cases, we could get counting results with errors less than 10%.