

Deterministic Radio Propagation Estimations in Judo venues for WSN deployment by 3D Ray Launching Method

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Judo is a very popular martial art, which is practiced by thousands of people not only at the competition level, but also as part of physical education programs at different school levels around the world. The environments where judo activity is held are usually complex indoor scenarios in terms of radio propagation due to their morphology, the presence of furniture, columns, equipment and the presence of human beings, which can be a major issue since the person density within this kind of scenarios could be high (e.g. many Judokas training at the same time). Taking into account that the main propagation phenomenon within this kind of scenarios is the multipath propagation, in this work an in-house 3D Ray Launching simulation tool has been used in order to obtain radio propagation estimations within Judo venues with the aim of assessing the deployment of WSNs, which can allow the simultaneous monitoring of multiple judokas minimizing the efforts of the coach staff and medical supervisor, as well as to aid referee activities or to enhance spectator experience in competitions.

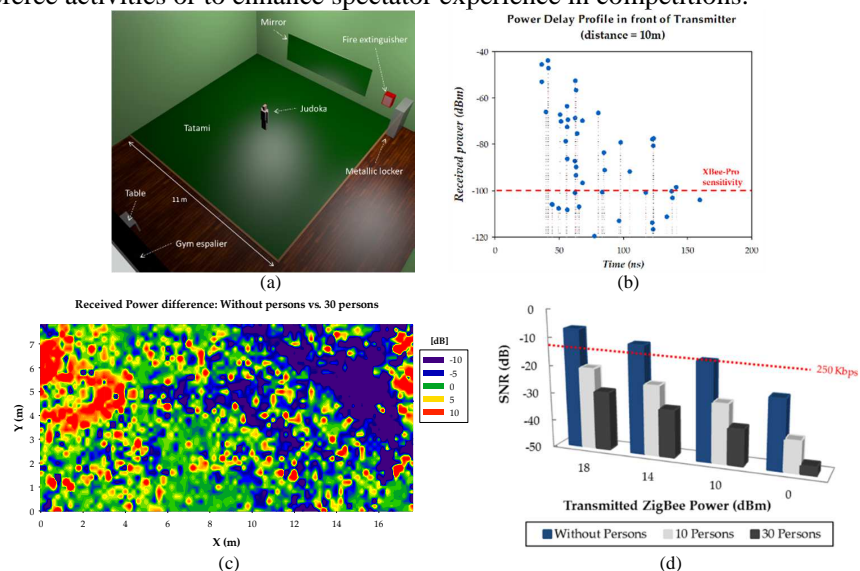


Figure 1. (a) Schematic view of a training venue for 3D Ray Launching simulations, (b) Power Delay Profile, (c) RF power level difference between results without persons and with 30 persons in the scenario, (d) Estimated SNR values for different configurations of a ZigBee link when a WiFi access point is interfering .