

# Jordan University of Science and Technology

## 3D Passive Tag Localization Schemes for Indoor RFID Applications

**Authors:** A. Almaaitah, K. Ali, H. S. Hassanein and M. Ibnkahla,

**Abstract:** Accurate and efficient localization of tags are of utmost importance for numerous existing and forthcoming RFID applications. In this paper, we introduce two novel methods for three dimensional localization of the passive RFID tags. In the first approach, namely Adaptive Power Multilateration (APM), using four RFID readers, distance estimations parameters are processed based on the minimal interrogation power and multilateration. Whereas in the second approach, namely Adaptive Power with Antenna Array (APAA), a single RFID reader equipped with horizontal and vertical smart antennas alongside with the reader's adaptive power levels are used for the tags distance estimations. The APM scheme localizes the tags with comparatively finer granularity whereas the APAA scheme supports reader's mobility and facilitates highly dense tag environments. Simulation results show that our proposed schemes provide more accurate localization than other indoor localization schemes.