

# **Sensing and Device Neighborhood-Based Slot Assignment Approach for the Internet of Things**

## **ABSTRACT**

Concurrent communication constitutes one of the challenging issues associated with IoT networks, as it is highly likely that multiple devices may start communication simultaneously. This issue has become more complex as devices belonging to the IoT networks increasingly become mobile. To resolve this issue, various mechanisms have been reported in the literature. However, none of these approaches has considered the neighborhood information of a server module to resolve this issue. In this paper, a neighborhood-based smart slot allocation scheme for the IoT is presented where member devices are mobile. In this scheme, every CH or server module is bound to maintain two different types of slots, i.e., dedicated and reserved. Dedicated slots are assigned to every device on a First-Come-First-Serve (FCFS) basis, whereas reserved slots are assigned to the migrated devices. Additionally, as long as a device  $C_i$  is located inside the server module's coverage area, it is required to use these dedicated slots. Simulation results verified that the proposed neighborhood-based slot allocation scheme performed better than existing approaches and considerably improved various performance metrics, such as 20% in lifetime, 27.8% in slot allocation, and 30.50% in slot waiting time.