ABSTRACT

Cognitive radio is defined as the radio capable of analyzing the environment to learn and detect the most suitable and effective way to utilize the available spectrum and modify its operating parameters to achieve this objective. Cognitive radio is an intellectual radio in which a corresponding communication system that has its knowledge like location and usage on RF range in that area. In CRN, the suitable learning technique should be accepted to learn and analyze the multiple traffic patterns on different channels over time and then determine the pre-eminent idle channels. However, some of the challenges present in cognitive radio networks like spectrum sensing, advanced spectrum management, hidden node and sharing issues, unlicensed spectrum usage, trusted access, security, and cross-layer design. Spectrum sensing had been analyzed as key enabling access to the radio spectrum of spare sections that monitors the spectrum to enhance that it does not cause undue interference. To achieve the effective system operation and to produce the required enhancement in spectrum efficiency, the main challenge of sensing in suitable sensing techniques that can determine every weak primary signal while being fast and low cost to implement. Existing researchers efficiently determined the suitable techniques to use the radio spectrum. However, these techniques had maximum spectrum sensing errors and high complexity in CRN. To solve these existing issues, this research proposed a new technique that enhanced the process of spectrum sensing and spectrum scheduling in the CRN network.

In the first phase, the Salp Swarm Optimization Algorithm (SSOA) sensing of available spectrum and scheduling the load to free spectrum. The Round Robin Algorithm (RR) is utilized for enhancing the selection of best

bandwidth among majority bandwidth. Finally, the performance measures are validated by using metrics of QoS, throughput, settling time, number of bands occupied by Base station (BS), and the bands occupied by each BS.

In the second objective, the Modified Spider Monkey Optimization (MSMO) is utilized for spectrum sensing and detection of the available spectrum. Then the Modified Round Robin Algorithm was used to schedule the load to free spectrum. In the end, the experimental results are proved that the various performance measures such as handoff, throughput, false alarm probability, the success probability are used.