

Handover Decision-Making Algorithm for 5G Heterogeneous Networks

ABSTRACT

The evolution of 5G small cell networks has led to the advancement of vertical handover decision-making algorithms. A mobile terminal (MT) tends to move from one place to another and, as the 5G network coverage is small, user network access will change frequently and lead to a high probability of unnecessary handover, which is a waste of network resources and causes degradation of service quality. This paper aims to reduce the number of unnecessary handovers in 5G heterogeneous networks by proposing a handover decision-making algorithm that integrates the dwelling time prediction technique and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS). The proposed algorithm reduces the number of unnecessary handovers by estimating the connection time to a small cell network using the dwell time prediction technique. The TOPSIS evaluates the network quality and chooses the best network based on user preference. The result shows that the proposed handover algorithm reduces the number of unnecessary handovers to small cell networks in high-speed scenarios. It also saves the network connection cost by up to 27.51% compared with the TOPSIS-based handover algorithm. As for throughput achievement, the proposed algorithm yields an improvement of 5.12%. The proposed algorithm significantly reduces the number of unnecessary handovers in the high-speed scenario while fulfilling user preferences.