Mobile Traffic Management in Congested Cells using Fuzzy Logic

Authors : A. A. Balkhi, G. M. Mir, Javid A. Sheikh

Abstract : To cater the demands of increasing traffic with new applications the cellular mobile networks face new changes in deployment in infrastructure for making cellular networks heterogeneous. To reduce overhead processing the densely deployed cells require smart behavior with self-organizing capabilities with high adaptation to the neighborhood. We propose self-organization of unused resources usually excessive unused channels of neighbouring cells with densely populated cells to reduce handover failure rates. The neighboring cells share unused channels after fulfilling some conditional candidature criterion using threshold values so that they are not suffered themselves for starvation of channels in case of any abrupt change in traffic pattern. The cells are classified as 'red', 'yellow', or 'green', as per the available channels in cell which is governed by traffic pattern and thresholds. To combat the deficiency of channels in red cell, migration of unused channels from under-loaded cells, hierarchically from the qualified candidate neighboring cells is explored. The resources are returned back when the congested cell is capable of self-contained traffic management. In either of the cases conditional sharing of resources is executed for enhanced traffic management so that User Equipment (UE) is provided uninterrupted services with high Quality of Service (QoS). The fuzzy logic-based simulation results show that the proposed algorithm is efficiently in coincidence with improved successful handoffs.