

Handover for Dense Small Cells Heterogeneous Networks: A Power-Efficient Game Theoretical Approach

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Abstract : In this paper, a non-cooperative game method is formulated where all players compete to transmit at higher power. Every base station represents a player in the game. The game is solved by obtaining the Nash equilibrium (NE) where the game converges to optimality. The proposed method, named Power Efficient Handover Game Theoretic (PEHO-GT) approach, aims to control the handover in dense small cell networks. Players optimize their payoff by adjusting the transmission power to improve the performance in terms of throughput, handover, power consumption and load balancing. To select the desired transmission power for a player, the payoff function considers the gain of increasing the transmission power. Then, the cell selection takes place by deploying Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS). A game theoretical method is implemented for heterogeneous networks to validate the improvement obtained. Results reveal that the proposed method gives a throughput improvement while reducing the power consumption and minimizing the frequent handover.

Keywords : energy efficiency, game theory, handover, HetNets, small cells

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