

OPTIMIZING ENERGY EFFICIENCY IN TWO-OPERATOR HETEROGENEOUS NETWORKS

Zaid Mujaiyid Putra Bin Ahmad Baidowi and Xiaoli Chu
The University of Sheffield, UK

We propose a scheme to optimize the energy efficiency (EE) of two-operator heterogeneous networks where each operator owns a two-tier network (containing macro cells and small cells). We consider the joint cell association and resource blocks (RBs) allocation problem where multiple small base stations (SBSs) of the two operators are distributed in the coverage area of each macro base station (MBS). A typical mobile user (MU) is served by an MBS of a certain network operator. The MU will be associated with any SBS that offers an optimal EE for better performance of the network operator. The EE of each MU that is communication between the MU and the nearby SBSs are calculated. Then, one of the SBSs will be selected as a serving SBS to the MU. We consider two cases for selecting the serving SBS (i) the SBSs that belong to the same operator of the current serving MBS and (ii) the SBSs that belong to the different operator of the current serving MBS. The formulated optimization problem is a mixed integer non-linear programming problem which is hard to solve. Therefore, we relax the integer variable to obtain an upper bound. Then, we transformed the fractional structure of the objective function into a subtractive structure which is a non-convex problem. Lastly, we transformed it into a convex problem by applying the successive convex approximation (SCA) method. The convex problem is solved by Lagrangian dual method to find an optimal RB allocation and using the subgradient method to find a dual optimal point. Since this study is still in progress, no result is presented here. The expected result is that our proposed scheme could achieve a flexible user association with optimal RBs allocation. Consequently, the overall network operators' performance will improve.

Biography

Zaid Mujaiyid Putra Bin Ahmad Baidowi is currently pursuing his PhD in Wireless Communications, Electronic and Electrical Department at The University of Sheffield, United Kingdom. He has completed his Master of Science in Information Security from Universiti Teknologi Malaysia and BSc (Hons) in Data Communication and Networking from Universiti Teknologi MARA, Malaysia, respectively. He was an Academician in Universiti Teknologi MARA, Malaysia before he joined as a PhD student in the year 2016, under the Malaysian Government's scholarship.

zmpahmadbaidowi1@sheffield.ac.uk