Joint Resource Allocation and Task Offloading for Hybrid NOMA-assisted MEC Network with Network Slicing

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***Abstract*—Mobile edge computing (MEC) and non-orthogonal multiple access (NOMA) are regarded as promising technologies in fifth-generation (5G) networks. This paper proposes a hybrid NOMA-assisted MEC network slicing scenario. In one network slice, users are divided into some groups and use hybrid NOMA to occupy channel for communication. A two-step resource allocation and task offloading algorithm is proposed to minimize the total network energy consumption under the premise of maximum delay tolerance. The optimization problem is divided into two subproblems. One subproblem is the optimal resource allocation problem for users within a group, and the other is the user grouping problem. A two-layer deep reinforcement learning (DRL) algorithm based on double deep Q network (DDQN) is used to solve the resource allocation within a group, and a swap matching algorithm is used to solve the user grouping. The simulation results show that the proposed algorithm can effectively reduce the total energy consumption. Compared with DQN and Q-learning, the proposed DRL algorithm has faster convergence speed and better convergence value. Compared with exhaustive search, matching search has lower complexity and similar performance.**

***Keyword*—MEC, hybrid NOMA, network slicing, DRL, swap matching**

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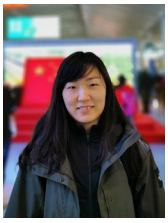

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