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A Reinforcement Learning Approach to Service Based User Admission in a Multi-Tier 5G Wireless Networks

The expected massive connectivity in 5G wireless network is bound to become a challenge to service providers. Many services over the 5G network will be aligned to a particular radio access network (RAN). As a result admitting a service based user to a particular RAN will depend to the most efficient radio access technology selection(RAT). This is because 5G network will adopt multi-tier radio access networks ranging from high power macro base stations to extremely low power Bluetooth connectivity. Selection of a service oriented RAT is critical because some wireless services have superior quality of service under certain RATs. Maintaining efficient RAT selection by network operators will improve power allocation efficiency, bandwidth allocation efficiency and operation expenditure. The complexity of associating a RAT to service based user while considering network state such as service packet size, the turn around time, the power allocation has not to been fully explored.

In this paper we propose a reinforcement learning approach to user admission based on efficient RAT selection considering wireless services in a cross tier wireless radio access network domain. The proposed algorithm is expected to improve RAT selection efficiency while minimizing the computation complexity. We perform extensive simulation using Python dynamic libraries and present our results along side existing approaches

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