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A survey on Deep Reinforcement Learning based Cloud Radio Access Network

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Abstract

With the dramatic increase of using mobile applications, high-speed broadband networks and low latency connections have brought many challenges for mobile operators such as high energy, guaranteeing the quality of services, performance enhancement, etc. Cloud radio access network (C-RAN), as new network architecture, is proposed to face these challenges by decoupling the baseband unit (BBU) and remote radio head (RRH). The BBUs are placed in a centralized location and the RRHs are distributed geographically.

Deep Reinforcement Learning (DRL) appears to be a viable method, resource management in the cloud, and reducing the latency. The convergence of C-RAN and DRL is believed to bring new possibilities to both interdisciplinary researches and industrial applications. This article provides a comprehensive survey of the state-of-the-art DRL techniques applied in C-RAN. A brief introduction is given in the C-RAN architecture and DRL techniques to have insights on these two emerging technologies. The reviewed works are categorized in terms of their optimization objectives mentioning the key ideas of DRL applied in the works.

Keywords: Cloud Radio Access network, Deep Reinforcement Learning, Agent, Policy