

Power Allocation in User-Centric Cell-Free Massive MIMO Systems with Limited Fronthaul Capacity

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Abstract : In this paper, we study two power allocation problems for an uplink user-centric (UC) cell-free massive multiple-input multiple-output (CF-mMIMO) system. Besides, we assume each access point (AP) is connected to a central processing unit (CPU) via a fronthaul link with limited capacity. To efficiently use the fronthaul capacity, two strategies for transmitting signals from APs to the CPU are employed, namely compress-forward-estimate (CFE) and estimate-compress-forward (ECF). The capacity of the aforementioned strategies in user-centric CF-mMIMO is derived. Then, we solved the two power allocation problems with minimum spectral efficiency (SE) and sum-SE maximization objectives for ECF and CFE strategies.

Keywords : cell-free massive MIMO, limited capacity fronthaul, spectral efficiency, optimization

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