GPU accelerated successive interference cancellation for NOMA uplink with user clustering

ABSTRACT

Non-orthogonal multiple access (NOMA) can achieve high throughput by using the same time and frequency resources for multiple users. NOMA distinguishes multiple users in power domain by computationally-heavy successive interference cancellation (SIC) method. Recently, outsourcing baseband computations to graphics processing units (GPUs) have become an attractive solution for some wireless communication applications, particularly for the ones include parallel processing. Although SIC is a sequential operation, when user clustering is deployed, multiple SIC operations are required and GPU based computation becomes a natural solution to alleviate the high computation demand of SIC receivers. In this work, we implemented GPU based SIC implementation for uplink NOMA systems with user clustering and our results reveal a significant speedup when compared to that of using central processing unit based computations.