Improving Spectral Efficiency in NOMA Power domain techniques by SC and SIC

ABSTRACT

In FDMA implementations, such as Orthogonal Frequency Division Multiple Access (OFDMA), information for each user is assigned to a subset of subcarrier. NOMA is fundamentals different than other multiple access schemes which provide orthogonal access to the user either in time, frequency, code or space. In NOMA, each user operates in the same band and at the same time where they are distinguished by their power levels.

NOMA has received tremendous attention for the design of radio access techniques for fifth generation wireless networks. The basic concept of NOMA is to serve more than one user in the same resource block and significantly improve the spectral efficiency of Mobile communication network. The increasing demand of Mobile internet and Internet of Things poses challenging requirements for 5G Wireless communications, such as high spectral efficiency and massive connectivity.

There are different types of NOMA techniques, including Power- domain and Code-domain. Power–domain attains multiplexing in power-domain, whereas Code-domain NOMA achieves multiplexing in Code-domain. This paper focuses on Power-domain NOMA. NOMA uses the Power-domain to separate signals from each other. It utilizes the superposition coding (SC) at the transmitter and successive interference cancellation (SIC) at the receiver side. NOMA gives a new dimension in which signals can be separated and given access to a base station. The Performance gain of NOMA compare to that of OFDMA increases when the differences in channel gain the path loss, NOMA provides higher sum rate than OFDMA. This technique that has been used within 2G, 3G or 4G before.