(SD2015-242) Apparatus and Method For Transmitting Signal Using Sliding-Window Coded Modulation In A Wireless Network

Tech ID: 30336 / UC Case 2015-242-0

BACKGROUND

To meet the demand for wireless data traffic having increased since deployment of 4G communication systems, efforts have been made to develop an improved 5G or pre-5G communication system. Therefore, the 5G or pre-5G communication system is also called a 'Beyond 4G Network' or a 'Post LTE System'. The 5G communication system is considered to be implemented in higher frequency (mm Wave) bands, e.g., 60GHz bands, so as to accomplish higher data rates. To decrease propagation loss of the radio waves and increase the transmission distance, the beamforming, massive multiple-input multiple-output (MIMO), Full Dimensional MIMO (FD-MIMO), array antenna, an analog beam forming, large scale antenna techniques are discussed in 5G communication systems

In addition, in 5G communication systems, development for system network improvement is under way based on advanced small cells, cloud Radio Access Networks (RANs), ultra-dense networks, device-to-device (D2D) communication, wireless backhaul, moving network, cooperative communication, Coordinated Multi-Points (CoMP), reception-end interference cancellation and the like.

In the 5G system, Hybrid FSK and QAM Modulation (FQAM) and sliding window superposition coding (SWSC) as an advanced coding modulation (ACM), and filter bank multi carrier(FBMC), non-orthogonal multiple access(NOMA), and sparse code multiple access (SCMA) as an advanced access technology have been developed.

The sliding-window superposition coding (SWSC) is a coding method capable of reaching a theoretical critical value performance of a physical layer in an additive white Gaussian noise (A WGN) interference environment where a fading is not generated, and thus the SWSC has a high efficiency.

TECHNOLOGY DESCRIPTION

Researchers from UC San Diego in collaboration with engineers from Samsung Electronics have patented a method for communicating with users positioned in a cell edge where performance is degraded due to interference from an adjacent cell in a cellular communication environment, and provides a method and an apparatus capable of applying a sliding-window superposition coding (SWSC) information theory scheme to a wireless cellular environment.

This invention relates to a pre- 5th-Generation (5G) or 5G communication system to be provided for supporting higher data rates beyond 4th-Generation (4G) communication system such as Long Term Evolution (LTE). A performance of the existing sliding-window superposition coding (SWSC) is degraded when a wireless channel state is changed due to a large scale fading and a small scale fading. In addition, the performance of the existing SWSC is degraded when channel state information at a receiver is different from that of the real channel.

APPLICATIONS

Adaptive SWCM can be used for interference management in downlink and/or uplink scenarios for cellular networks.

ADVANTAGES

More specifically, this technology provides a sliding-window coded modulation in cellular networks, which consists of successive cancellation with soft information and sliding-window iterative decoding on the receiver side; and multiple layers for both sender, adaptive bit mapping, and power allocation parameters on the sender side. It also proposes cellular operations for SWCM such as frame structure, resource allocation for the 3GPP LTE standard, signaling between base stations and user equipment, and the cooperation of the base stations.

INTELLECTUAL PROPERTY INFO

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OTHER INFORMATION

KEYWORDS

5G, Wireless network, higher data rates, sliding-window superposition coding, SWSC

CATEGORIZED AS

- Communications
  - Wireless

RELATED CASES

2015-242-0, 2016-157-0

University is seeking opportunities to commercially develop this technology through non-exclusive licensing of patent rights in the US (US 9,699,008) and China (CN108028722A).

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,699,008	07/04/2017	2015-242

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