(SD2017-316) Electronic Device and Method for Scheduling for Enhanced Transmission Efficiency Over a Wireless Communication Network

Tech ID: 30344 / UC Case 2017-316-0

BACKGROUND

Existing cellular networks assume that interference from neighboring cells is treated as noise and mobile devices are selected (scheduled) to communicate based on performance metrics for each device. When sliding-window coded modulation (SWCM) is used however, the performance metrics depend on those of interfering devices in neighboring cells, and hence scheduling has to be performed simultaneously over multiple cells.

TECHNOLOGY DESCRIPTION

Researchers from UC San Diego in collaboration with Samsung Electronics have developed and patented an electronic device and method for performing scheduling that presents enhanced transmission efficiency over a wireless communication network. This streamlined approach to this simultaneous scheduling task that can be implemented in low complexity. This invention proposes scheduling techniques for wireless devices that use sliding-window coded modulation over wireless networks consisting of multiple cells.

https://patents.google.com/patent/US11540308B2

CONTACT

Skip Cynar
scynar@ucsd.edu
tel: 858-822-2672.

OTHER INFORMATION

KEYWORDS

Wireless communication, Enhanced transmission efficiency, wireless devices, cellular networks

CATEGORIZED AS

- Communications
  - Wireless

RELATED CASES

2017-316-0

(12) **United States Patent**
Ahn et al.

(10) **Patent No.: US 11,540,308 B2**
(45) **Date of Patent: Dec. 27, 2022**

(54) **APPARATUS AND METHOD FOR SCHEDULING IN WIRELESS COMMUNICATION SYSTEM USING SLIDING WINDOW SUPERPOSITION CODING SCHEME**

(71) Applicants: **Samsung Electronics Co., Ltd.**, Suwon-si (KR); **The Regents of The University of California**, Oakland, CA (US)

(72) Inventors: **Seokki Ahn**, Suwon-si (KR); **Kwangtaik Kim**, Suwon-si (KR); **Young-Han Kim**, San Diego, CA (US)

(73) Assignees: **Samsung Electronics Co., Ltd.**, Suwon-si (KR); **The Regents of The University of California**, Oakland, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 129 days.

(21) Appl. No.: **15/733,203**

(22) PCT Filed: **Nov. 28, 2018**

(86) PCT No.: **PCT/KR2018/014778**
§ 371 (c)(1),
(2) Date: **Jun. 9, 2020**

(87) PCT Pub. No.: **WO2019/117508**
PCT Pub. Date: **Jun. 20, 2019**

(65) **Prior Publication Data**

US 2021/0105806 A1 Apr. 8, 2021

(30) **Foreign Application Priority Data**

Dec. 11, 2017 (KR) 10-2017-0169563

(51) **Int. Cl.**
H04L 1/18 (2006.01)
H04W 28/22 (2009.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H04W 72/1278*** (2013.01); ***H04L 1/0003*** (2013.01); ***H04L 1/1832*** (2013.01); ***H04W 28/22*** (2013.01); ***H04W 72/042*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2007/0298718 A1 12/2007 Je et al.
2010/0232534 A1 9/2010 Lee et al.
(Continued)

FOREIGN PATENT DOCUMENTS

KR 10-2007-0122044 A 12/2007
KR 10-2009-0025034 A 3/2009
(Continued)

OTHER PUBLICATIONS

International Search Report and Written Opinion of the International Searching Authority in connection with International Application No. PCT/KR2018/014778 dated Mar. 8, 2019, 9 pages.
(Continued)

Primary Examiner — The Hy Nguyen

(57) **ABSTRACT**

The present disclosure relates to a method and apparatus for transmitting and receiving data in a wireless communication system. In particular, the present disclosure relates to a scheduling method and apparatus for transmitting and receiving data in a wireless communication system using a sliding window superposition coding scheme. In the present disclosure, in a wireless communication system, if a UE is located in a cell edge, data throughput can be improved. An
(Continued)

APPLICATIONS

A method for performing scheduling by a first base station over a wireless communication network, and an apparatus therefor are provided. The method includes receiving first channel status information (CSI) measured by a user equipment (UE) positioned in coverage of the first base station and second CSI, determining a first transmission rate for any one of the at least one UE positioned in the coverage of the first base station and a second transmission rate for any one of the at least one UE positioned in the coverage of the second base station, determining a third transmission rate for a first UE among the at least one UE positioned in the coverage of the first base station and a fourth transmission rate for a second UE among the at least one UE positioned in the coverage of the second base station, and performing scheduling.

INTELLECTUAL PROPERTY INFO

UC San Diego is seeking opportunities to develop this patent-pending technology into commercial products through non-exclusive licensing.

PATENT STATUS

Patent Pending

University of California, San Diego
Office of Innovation and Commercialization
9500 Gilman Drive, MC 0910, ,
La Jolla,CA 92093-0910

Tel: 858.534.5815
innovation@ucsd.edu
https://innovation.ucsd.edu
Fax: 858.534.7345