PHYSICAL LAYER METRICS TO SUPPORT ADAPTIVE STATION-DEPENDENT CHANNEL STATE INFORMATION FEEDBACK RATE IN MULTI-USER COMMUNICATION SYSTEMS

CLAIM OF PRIORITY UNDER 35 U.S.C. §119

The present Application for Patent claims benefit of U.S. Provisional Patent Application Ser. No. 61/244,528, entitled, "Physical Layer Metrics to Support Adaptive Station-Dependent Channel State Information Feedback Rate in Multi-User Communication Systems," filed Sep. 22, 2009, and U.S. Provisional Patent Application Ser. No. 61/304,929, entitled, "Physical Layer Metrics to Support Adaptive Station-Dependent Channel State Information Feedback Rate in Multi-User Communication Systems," filed Feb. 16, 2010, both assigned to the assignee hereof and hereby expressly incorporated by reference herein.

TECHNICAL FIELD

Certain aspects of the present disclosure generally relate to wireless communications and, more particularly, to designing physical layer metrics to support an adaptive station-dependent channel state information feedback rate in multi-user communication systems.

BACKGROUND

In order to address the issue of increasing bandwidth requirements that are demanded for wireless communications systems, different schemes are being developed to allow multiple user terminals to communicate with a single access point (AP) by sharing the channel resources while achieving high data throughputs. Multiple Input or Multiple Output (MIMO) technology represents one such approach that has recently emerged as a popular technique for the next generation communication systems. MIMO technology has been adopted in several emerging wireless communications standards such as the Institute of Electrical and Electronic Engineers (IEEE) 802.11 standard. IEEE 802.11 denotes a set of Wireless Local Area Network (WLAN) air interface standards developed by the IEEE 802.11 committee for short-range communications (e.g., tens of meters to a few hundred meters).

A MIMO wireless system employs a number (N_T) of transmit antennas and a number (N_R) of receive antennas for data transmission. A MIMO channel formed by the N_T transmit and N_R receive antennas may be decomposed into N_S spatial streams, where, for all practical purposes, $N_S <= \min\{N_T, N_R\}$. The N_S spatial streams may be used to transmit N_S independent data streams to achieve greater overall throughput.

In wireless networks with a single Access Point and multiple stations, concurrent transmissions may occur on multiple channels toward different stations, both in the uplink (UL) and downlink (DL) direction. Many challenges are presented in such systems. For example, an access point may transmit signals using different standards such as the IEEE 802.11n/a/b/g or the IEEE 802.11ac standards. The receiver should be able to detect the transmission mode of the signal based on the information included in the preamble of the packet.

SUMMARY

Certain aspects of the present disclosure provide a method for wireless communications by a first apparatus. The method generally includes obtaining a current channel estimate, obtaining a recent channel estimate that was communicated to a second apparatus, and calculating a first metric based at least on the current channel estimate or the recent channel estimate, wherein the first metric is used for determining whether a channel state information (CSI) update is to be sent to the second apparatus.

Certain aspects of the present disclosure provide an apparatus for wireless communications. The apparatus generally includes an estimator configured to obtain a current channel estimate, wherein the estimator is also configured to obtain a recent channel estimate that was communicated to another apparatus, and a circuit configured to calculate a first metric based at least on the current channel estimate or the recent channel estimate, wherein the first metric is used for determining whether a channel state information (CSI) update is to be sent to the other apparatus.

Certain aspects of the present disclosure provide an apparatus for wireless communications. The apparatus generally includes means for obtaining a current channel estimate, means for obtaining a recent channel estimate that was communicated to another apparatus, and means for calculating a first metric based at least on the current channel estimate or the recent channel estimate, wherein the first metric is used for determining whether a channel state information (CSI) update is to be sent to the other apparatus.

Certain aspects of the present disclosure provide a computer-program product for wireless communications. The computer-program product includes a computer-readable medium comprising instructions executable to obtain a current channel estimate, obtain a recent channel estimate that was communicated to a second apparatus, and calculate a first metric based at least on the current channel estimate or the recent channel estimate, wherein the first metric is used for determining whether a channel state information (CSI) update is to be sent to the second apparatus.

Certain aspects of the present disclosure provide a wireless node. The wireless node generally includes at least one antenna, an estimator configured to obtain a current channel estimate, wherein the estimator is also configured to obtain a recent channel estimate that was communicated to an access point, and a circuit configured to calculate a first metric based at least on the current channel estimate or the recent channel estimate, wherein the first metric is used for determining whether a channel state information (CSI) update is to be sent via the at least one antenna to the access point.

Certain aspects of the present disclosure provide a method for wireless communications. The method generally includes obtaining a current channel estimate and a recent channel estimate from an apparatus, and calculating a first metric based at least on the current channel estimate or the recent channel estimate, wherein the first metric is used for determining whether a channel state information (CSI) update is to be requested from the apparatus.

Certain aspects of the present disclosure provide an apparatus for wireless communications. The apparatus generally includes a receiver configured to obtain a current channel estimate and a recent channel estimate from another apparatus, and a circuit configured to calculate a first metric based at least on the current channel estimate or the recent channel estimate, wherein the first metric is used for determining whether a channel state information (CSI) update is to be requested from the other apparatus.

Certain aspects of the present disclosure provide an apparatus for wireless communications. The apparatus generally includes means for obtaining a current channel estimate and a recent channel estimate from another apparatus, and means