

Multiple-Input Multiple-Output (MIMO) Communication System Using Reconfigurable Antennas

Tech ID: 29058 / UC Case 2009-546-0

BRIEF DESCRIPTION

Multiple-Input Multiple-Output (MIMO) communication systems, which increase communication speed and signal quality using multi-path propagation, have become an essential part of modern wireless communication such as Wi-Fi and 4G mobile internet connectivity. UCI inventors have developed a wireless communication system architecture that, by using reconfigurable antennas, improves the data throughput capacity and lowers implementation cost and complexity for MIMO communication systems.

FULL DESCRIPTION

MIMO communications systems are capable of providing high-speed, high-quality wireless communications. A traditional MIMO system requires multiple physical antennas, posing a major challenge to the adoption of such systems in mobile devices. Reconfigurable antennas are a promising way to eliminate the need for multiple antennas, by using a single antenna capable of altering its radiation pattern, operating frequency and/or polarization characteristics. State of the art MIMO systems have only been able to implement reconfigurable antennas on the receiver side.

UCI inventors have reduced the cost, power consumption, and implementation complexity of current MIMO systems by developing a general case which employs the reconfigurable antennas at both the transmitter and receiver. By employing a state-switching scheme at the transmitter and a state-selection scheme at the receiver, efficiency and performance of the MIMO system are enhanced. Average signal to noise ratio (SNR) is enhanced while achieving maximum diversity gains, an improvement upon wireless communication in existing and next generation systems.

SUGGESTED USES

- » Implementation of reconfigurable antennas into MIMO communications systems where small form factor, low power consumption, and hardware cost are important

ADVANTAGES

- » Decreases the required size of antenna arrays for space-sensitive devices
- » Reduces cost of MIMO implementation by using less radio frequency (RF) hardware on both transmitter and receiver sides
- » Provides superior reliability and efficiency when compared to traditional MIMO systems

PATENT STATUS

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OTHER INFORMATION

CATEGORIZED AS

- » Communications
- » Internet
- » Networking
- » Wireless
- » Engineering
- » Other

RELATED CASES

2009-546-0

Country	Type	Number	Dated	Case
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United States Of America	Issued Patent	8,638,872	06/28/2014	2009-546
RELATED MATERIALS				
» Fazel, F.; Grau, A.; Jafarkhani, H.; Flaviis, F. IEEE Transactions on Wireless Communications 2009, 8 (12), 6019–6029. - 12/11/2009				

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