Multi-User Millimeter Wave MIMO with Full-Dimensional Lens Antenna Array

ABSTRACT

Millimeter wave (mmWave) communication using lens antenna arrays is a promising technique for realizing costeffective large MIMO (multiple-input multiple-output) systems with only limited radio frequency (RF) chains. This paper studies a multi-user mmWave single-sided lens MIMO system, where the base station (BS) is equipped with a full-dimensional (FD) lens antenna array and each mobile station (MS) employs the conventional antenna arrays. To this end, a new technique called *path delay compensation is proposed at the BS to transform the multiuser* frequency-selective MIMO channels to parallel frequency flat small-size MIMO channels. In addition, we propose an efficient channel estimation scheme tailored for the Scbased PDMA, which requires negligible training overhead in practical mmWave systems and yet leads to comparable performance as that with perfect channel state information (CSI).

EXISTING SYSTEM

- In existing system, a low-complexity spatial multiplexing technique, path division multiplexing (PDM), for the point-to-point mmWave MIMO channel, which is capacity approaching using the simple single-carrier (SC) transmission with low RF chain cost and signal processing complexity, even for wide-band frequency-selective mmWave communications.

- However, ignores the signal's elevation angles, and thus the antenna elements are designed to be located in the focal arc of the lens only.

- Due to the additional gap required between the EM lens and antenna elements, lens antenna array is expected to be more suitable to be employed at the BS than at the MS.

PROPOSED SYSTEM

- We propose a novel channel estimation scheme tailored for the MRC-based PDMA scheme in single sided lens MIMO system.

- An efficient channel estimation scheme with much reduced training overhead, which consists of three phases, namely power-based antenna selection, path estimation and association, and reduced MIMO channel estimation.

- This scheme achieves comparable performance as the benchmark UPA systems with MIMO-OFDM and hybrid analog/digital signal processing

SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

•Processor   -   Intel core i3

•RAM   - 2B

•Hard Disk   -   20 GB

SOFTWARE REQUIREMENTS

•Operating System : LINUX

•Tool : Network Simulator-2

•Front End : OTCL (Object Oriented Tool Command Language)

REFERENCE

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