

High-Quality Video Communication over Wireless Systems

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Abstract:

Currently sophisticated wireless technologies have enabled high-speed data transmission in home and personal networks. As a wireless communication standard, the IEEE802.11ac based wireless LAN supports the throughput of 1.5Gbps at a 40-MHz frequency band width (BW), 3.0Gbps at 80-MHz BW and 6.0Gbps at 160-MHz BW by using a multiple-input and multiple-out (MIMO) stream technique with orthogonal frequency division multiplexing (OFDM). This high throughput can be in particular expected for the use of high quality video wireless communications. In this talk, new wireless systems “over 1G” bps throughput, “over 80MHz” bandwidth and “less than 6GHz” carrier are introduced. In addition, some results are also introduced when such high speed wireless systems are applied for high quality video transmission.

Our past system had the goal to achieve the data rate of 3.0Gbps by use of an 80-MHz baseband bandwidth and a 8x8 MIMO scheme several years ago. This talk describes the VLSI implementation of the designed 8 x 8 MIMO-OFDM system. A low-latency and the optimum pipelined architecture are employed for all processing blocks to provide the real-time operations on OFDM modulation and MIMO detection. The proposed architecture has realized low power consumption. This system has been applied for High-Quality Video communication. With some of results on field experiments, the system performance for video communications is also introduced.