Antenna selection for high-speed telecoms

A novel algorithm for selection of joint transmit-receive antenna for MIMO systems offers reduction both in cost and hardware complexity.

The Oxford invention

Oxford University inventors have developed an antenna selection control system that reduces the cost and hardware complexity of current multiple-input multiple-output (MIMO) wireless communication systems while maintaining their performance advantages. The algorithm within the controller can be used for both ends of the wireless link and is based on an advanced signal processing technique: the cross optimization method. The invention can be applied to most MIMO wireless systems, and performance is within 99% of the optimum capacity of a conventional system.

Figure 2 demonstrates the robustness of the antenna selection algorithm, by comparing the performance of the algorithm in four different selection criterions and strategies: concurrent capacity based (CCB), concurrent norm based (CNB), sequential capacity based (SCB) and sequential norm based (SNB) antenna selection algorithms. Our algorithm obtains near optimal results in the case of CCB and SCB. Moreover, we can find that the CCB and SCB selection algorithms are also immune to the selected antenna array size.

Figure 1: A MIMO base station

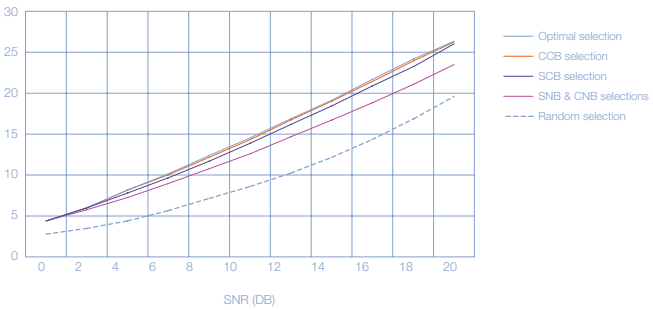

Figure 2: 10% outage capacity versus Signal to Noise ratio (SNR)

Marketing opportunity

According to WTRS, the market for smart antenna chipsets is expected to grow from $985 million of sales in 2008 to over $2 billion in 2010. The primary factors driving MIMO adoption in the Wi-Fi market place include reduction in radio system complexity and cost reductions.

Patent status

This work is the subject of a UK patent application, and Isis would like to talk to companies interested in commercialising this opportunity. Please contact the Isis Project Manager to discuss this further.

The invention can be applied to most MIMO wireless systems

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