MIMO Capacity Performance of Off-Body Radio Channels in a Street Environment

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Abstract:

This paper presents an analysis of the performance of a 2x2 MIMO system in off-body communications in a multipath environment. The modelling of wearable antennas in Body Area Networks has been separated into antennas in the vicinity of the body (full wave simulations), including body dynamics (taken from motion capture analysis), and street environment (clusters of scatterers). Multi-Path Components are calculated using a Geometrically Based Statistical Channel model. A street scenario is simulated, for a running body, and for 9 on-body antenna placements. The analysis of MIMO capacity is performed and the optimum location of antennas is selected. The MIMO capacity s trongly depends on the power imbalance between antennas. The results indicate that for the considered scenario, the head and arm on the left pair outperforms the others, the average overall capacity performance being 68% above its minimum.