Correlation Analysis of Off-Body Radio Channels in a Street Environment

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Abstract:

This paper presents an analysis of the correlation between various links 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 or walking body, and for 9 on-body antenna placements. The results allow to identify 3 classes of antennas, i.e., co-directed (CD), cross-directed (XD) and oppositedirected (OD). The CD class is characterised by the highest average correlation, equal to 0.56, whereas XD and OD present values of 0.40 and 0.28, respectively.
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