Ray Tracing Propagation Modelling: Future Prospects

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Abstract

Future short-range, high frequency or millimetre-wave wireless systems with high-order MIMO or beamforming solutions represent the ideal field of application of deterministic propagation models such as Ray Tracing (RT). In fact the small wavelength compared to the size of the obstacles and the limited coverage area allow a very detailed description of the environment and very good prediction accuracy.

The capability of RT models to predict the spatial, temporal and polarimetric characteristic of the radio channel, which is very valuable for modern MIMO systems, has ben widely studied in the last years and will be discussed this contribution.

Moreover, the increasing availability of low-cost computation power, accurate 3D digital building maps and positioning capabilities will probably encourage the widespread use of deterministic propagation models in the future, not only for design and planning purposes, but also for real-time channel-state information estimation.

Following this outline, future research frontiers, applications, issues and potential of RT propagation models will be discussed in this presentation.