

Tutorial

“Channel modeling for vehicular networks: intersections and combined PHY/MAC/NET simulations”

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In this tutorial, we first survey recent work in the field of channel modeling for vehicular communication networks and discuss why and when accurate modeling matters. Then, we will in detail address the two issues mentioned in the title. First, we present our work on modeling and simulation of the radio channel at intersections in urban scenarios and compare previously used models with the one based on our measurements. Second, we report on our recent work in bringing a physical layer simulator into the NS-3 network simulator for highly accurate cross-layer PHY/MAC/NET simulations. We discuss our findings how results differ when highly accurate channel models are used instead of models that assume that the channel is ‘constant’ at the packet level. Of course, there is a price to pay for this type of cross-layer simulations: we also discuss options how to make use of GPGPUs to speed up computations for these simulation studies.