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WANCHAI AMPHUCHINEEWAN : RADIO WAVE PROPAGATION MODELLING FOR MOBILE COMMUNICATION IN URBAN ENVIRONMENTS. THISIS ADVISER :ASSIST. PROF. CHATCHAI WAIYAPATTANAKORN, Ph.D. 116 pp.
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In the last decade, there have been several papers on propagation modelling using ray tracing method. This is because of the technique's flexibility and applicability to diverse urban topographic characteristics. Moreover, this type of model is more accurate than the present popular empirical model. The application of radio wave propagation modelling on mobile communication environment in Bangkok, mostly based on empirical model, has difficulty that it needs the adjustment of the model and consumes a lot of resources. This makes the propagation model inflexible and it is difficult to predict the propagation path loss over all areas with only one adjustment. The ray tracing model is investigated by the author for predicting the electric field's strength in Bangkok's urban areas. The buildings are modeled by groups of rectangular shapes with mixed height, smooth-flat surface and predetermined electrical characteristics. The antenna's parameters such as power pattern and the pointing direction are also included.

With building database and antenna database, basic ray tracing algorithm with field calculation using GO/UTD has been employed in the calculation of field strength. To reduce the complexity of ray tracing, the buildings are assumed to be the combination of simple rectangular shapes. With this approach, we can produce radio wave propagation model using basic ray tracing algorithm with simple building assumption and the correcting function from comparative analysis makes the model more accurate and reliable.

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