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# Hybrid Method of the Radio Environment Map Constrution to Increase Spectrum Awareness of Cognitive Radios

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Abstract: The paper presents the concept of the hybrid method for the Radio Environment Map (REM) construction. REMs are considered as a promising solution for Cognitive Radios (CR) because they can raise the awareness of the electromagnetic environment. This issue is particularly important for the dynamic spectrum management (DSM) since it has an impact on the quality of services provided by the network. The proposed hybrid method combines direct and indirect methods with the aim to achieve higher accuracy of maps. In our previous papers we analyzed the quality of maps created with the use of measurement results and selected direct methods. One of the conclusions was that Kriging interpolation technique is very promising since it offers the highest quality of maps. However, some limitation of the direct methods is the necessity of collecting measurement data from networks with a large number of sensors. The proposed hybrid method uses the results of measurements taken by sensors deployed in a real environment and also the results of the calculations based on the propagation model. The main idea of the method is to use a small number of sensors to adjust the propagation model. In the next step this adjusted propagation model is used to calculate the signal level for the set of points that are treated as virtual sensors and that are applied to increase the quality of maps created with the use of a selected interpolation technique.

Keywords:Cognitive radio, Radio environment map, Spectrum monitoring,

Propagation models,Interpolation techniques

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