Announcing a Special Section of IEEE Access:

Submission Deadline: Sept 30, 2014

IEEE Access invites manuscript submissions in the area of Real Time Radio Propagation Modeling.

Radio propagation modeling and prediction are important for the fundamental understanding of the interaction of electromagnetic (EM) waves with the environment as well as for the design and performance evaluation of wireless communications and radar systems. Traditionally, propagation modeling can be roughly classified as theoretical, empirical, and numerical. The theoretical approach is accurate and fast although it is only applicable to some simple and ideal cases. The empirical method is based on extensive measurements carried out in a typical environment and provides a set of formulas for propagation prediction in a similar environment.

The third approach, the numerical method, is the focus of this Special Section of IEEE Access. It is well known that in modern science and engineering, numerical simulation is as important as theoretical and experimental research. For radio propagation modeling using numerical simulations, there are several challenges. First, the accurate modeling of the propagation environment including high resolution 3D terrains and building structures, weather conditions, vegetation, traffic, and many others and second is building the frequency dependent models. Wireless communications and radar systems employ a wide spectrum of EM waves, e.g., from megahertz to tens of gigahertz. Since different frequencies have different propagation characteristics, it is almost impossible to develop a single simulation method that can deal with all the propagation regimes with different frequencies. Finally, the computational resources, although increasing rapidly, are still a bottleneck for radio propagation simulation in complex environments.

We welcome original practical and/or review papers tackling these challenges. Focus should be on the exploitation of cyber resources such as terrain and weather information for establishing adequate models for propagation environments; exploitation of graphical processing units (GPU’s) for significant acceleration of computation speed including translation of CPU-based to GPU-based programs and development of algorithms for GPU’s; seamless integration of propagation models for different frequency bands; intelligent modeling schemes which take advantage of full 3D simulations and simplified/empirical models to achieve satisfactory accuracy and computational speed; integrative modeling paradigms that ultimately achieve real-time propagation modeling for wide variety of propagation scenarios.

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