



Arthur Imperatore School of Sciences and Arts

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*Coordinated Dynamic Spectrum Allocation  
for Next Generation Wireless Networks*

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Kidde 104

*Abstract:*

Spectrum is the scarce resource in both mobile and fixed wireless networks. The allocation of this scarce resource is typically performed by a government agency (the FCC in the United States) assigning a license for a fixed amount of spectrum to a given wireless service provider. Each license is intended for a specific application and examples include cellular and PCS mobile wireless, fixed wireless, broadcast TV, and public safety. The awarding of fixed licenses for specific purposes is typically a slow process and results in delays in introducing new wireless services and the inefficient use of spectrum.

We propose allocating a common band of spectrum that can be dynamically shared in a coordinated manner across multiple service providers. This assignment of spectrum on a real-time (or near real-time) basis will be coordinated by a central server with well defined policy and pricing rules. This new approach of spectrum sharing will lead to more efficient use of the spectrum, relieve over crowded spectrum, facilitate and quicken the introduction of new wireless services (3G and broadband fixed wireless), and lead to new business and economic models for the wireless market.

This research raises challenges in the design of spectrum management algorithms. These include: (1) demand processing and spectrum pricing models (2) operation with different network infrastructure options (3) spectrum management concepts of scope, access fairness, "stickiness" and spectrum utilization. This presentation will investigate an algorithm for spectrum pricing and allocation for homogeneous CDMA networks.

We welcome the opportunity to share this research with our colleagues in the Department of Mathematical Sciences with the hope of potential collaboration.

Dr. Milind Buddhikot (Lucent Technologies Bell Labs), Professor Ryan, and Elias Aravantinos, are part of the research team. This work is funded by an NSF grant and is a joint collaboration between researchers at Lucent Technologies Bell Labs and Stevens Institute of Technology.

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Refreshments will be provided.

For more information contact Darinka Dentcheva, Michael Zabarankin, Ionut Florescu, or call 201-216-5449.