Multi Femto-Relays (#5400)

A framework that can allow for the management of multiple femto cells while establishing and maintaining good links to external wireless infrastructure

The invention consists of a framework that can be tuned to a particular environment. The architecture comprises of integrating femtocell and relay capabilities in such a way as to allow different arrangements to be implemented in various indoor facilities such as office or apartment buildings. The Multifemto Relay (MFR) invention allows for management of multiple cells in conjunction with establishing and maintaining good links to external wireless infrastructure. In this manner, users inside the building get good coverage for their cell phones without interference while wireless network carriers are able to minimize the amount of infrastructure that is needed inside/close-to buildings to ensure good coverage for their customers. The increased coverage allows for better QoS (Quality of Service) and greater adaptability of infrastructure to the environment, users and other location specific characteristics.

Benefits/Advantages

- Reduced interference between femto cells that are located in close proximity
- Improved QoS for users in locations where traditional wireless coverage is limited or spotty
- Ability to deploy lower amount of infrastructure to achieve better coverage and load balancing between different devices
- Support a wide variety of wireless standards and protocols using less infrastructure

Potential Commercial Applications

- Cellular networks

Background/Context for This Invention

Indoor reception of wireless signals has always been a problem. This has been overcome by using smaller wireless infrastructure devices called micro, pico, and femto cells. These devices are able to act as tiny wireless towers inside offices and other buildings to enable good reception and transmission of voice and data from inside the buildings to larger infrastructure points such as base station towers on the outside. As the density of these devices proliferate, other issues such as interference between signals transmitted by two cellphones in close proximity to a wireless infrastructure device come into play and have to be resolved. This invention seeks to solve the interference issue for typical femtocell deployments while providing other benefits and an improved overall user experience.

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More Information

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Publications

For more information about this technology, please visit:
https://licensing.research.gatech.edu/technology/multi-femto-relays

Images:

The automated sequential delivery of multiple fluids. A varying number of delay gates imprinted in the branches are shown in the figure.

COVID-19 and flu saliva test on paper: (A) The automatic sequential delivery of multiple reagents required for virus test; (B) Water pouring into the device triggers the virus assay, allowing the presence of SARS-CoV-2 and influenza A & B viruses to be visually identified by the color changes in the corresponding detection spot