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Inventors

Martin Reisslein

Frank James

Contact

Shen Yan
shen.yan@skysonginnovations.
com

New Multi-nodal Wireless Communication System Method

Wireless communication happens through Wi-Fi and cellular channels. Technologies such as cell phones are increasingly using channels separately, but they have yet to converge. These devices both utilize radio frequency (RF) environments to transmit data, but struggle to alternate between different environments. The adaptation to different RF environments is left to wireless devices themselves, which must repeatedly transmit certain data at what is called the link layer communication level. When cell phones are unable to communicate with the local RF environment, there are performance issues such as loss of cell service, dropped calls, and roaming. These performance issues happen because cell phones are ill-equipped to alternate between different Wi-Fi and cellular access points when the link layer is not well distributed. Introducing new hardware components with the link layer would smooth the transition between Wi-Fi and cellular channels and between different RF environments.

Researchers at Arizona State University have developed an advanced multi-nodal communication system that provides an integrated link layer for both Wi-Fi and cellular data within specific cell coverage areas. Instead of transmitting link layer communication elements with software, they are integrated into new hardware elements. Standard link layer communication protocols are also slightly altered. This technique is able to significantly improve RF service capabilities and can be added to existing infrastructure. This will expand cellular coverage and improve the speed and quality of wireless data transmission.

Potential Applications

- Wireless base stations
- Personal cell phones and laptops
- Telecommunications devices
- Rugged telecommunication and personal electronic devices

Benefits and Advantages

- Improved Performance - Simplifying the communication mechanism for wireless devices improves overall coverage and decreases roaming and lost services.
- Mobility - Make network processing decisions at physically disparate locations to improve service over large physical areas.
- Streamlined Process - Decreases the overall amount of data which must be transferred with every process, making the process faster and smoother.
- Low Cost - Easily be integrated into existing infrastructure.

For more information about the inventor(s) and their research, please see

[Dr. Marten Reisslein's directory webpage](#)

[Frank James's directory webpage](#)