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System to control ambient RF energy for CWi-Fi tags

Value Proposition

Today, most Wi-Fi transmitters and receivers operate in the 2.4 GHz or 5 GHz frequency bands and there are many local area networks that are based on Wi-Fi in which access points enable Wi-Fi clients to gain access to networks such as the Internet. Wi-Fi communications is the most popular form of RF data communications today.

There's an unmet need to control radio-frequency (RF) energy for powering wireless devices. We need a way to "power-up" computational Wi-Fi tags and obtain an improved level of performance over that possible with an existing unmodified Wi-Fi infrastructure. The current invention takes the RF paths from access points to CWi-Fi tags into account when considering which access point's transmit power should be increased and how much it should be changed

Technology

The invention describes a system that controls groups of Wi-Fi devices to increase the energy available in specified locations. The system comprises a processor, coupled to a memory, that determines to increase radio-frequency (RF) energy available to power a wireless tag. The processor further controls the RF energy delivered to the wireless tag to provide the tag energy. It uses one or more of the following steps to do so:

1. Increasing transmission RF power of one or more wireless communication devices.
2. Increasing a duty cycle associated with wireless transmissions of one or more wireless communication devices.
3. Decreasing path loss of the power to the wireless tag.

The control system (in the above figure) includes CWi-Fi nodes that receive and harvest energy, perform some sensing and calculation, and communicate results with the Wi-Fi infrastructure. This special purpose device simultaneously measures the total energy across the 2.4 GHz ISM band and detailed measurements of the energy observed within the band. This provides the information necessary to design energy harvesting circuitry that produces the optimum performance.

Advantages

- Requires no hardware modifications – adapts an existing infrastructure
- Minimizes unnecessary interference on the Wi-Fi band
- Provides predictable amount of power to the tags

