Multi-Antenna Signaling for Low-Powered Communications

A set of techniques that work together to enhance the range and reliability of radio frequency tags

Inventors at Georgia Tech have developed techniques that can extend the range and the potential data rate of low-power communication. These techniques use multiple antennas at the transmitter, receiver, and RF tag and will soon allow the exchange of low data rates over long distances. The techniques have the capability to allow RF tags to return high powered signals with higher data rates back to a reader unit. This allows for the sweeping of an RF waveform through space so that passive radio devices may more effectively harvest energy and boost the collection of microwave power by an energy-harvesting RF tag using multiple antennas. Collectively, these techniques work together to enhance the range and reliability of RF tags.

Summary Bullets

- **Low-power**: can substantially reduce the power required by electronics to perform data exchange
- **Greater range**: techniques yield greater operational distances
- **Low costs**: RF tags can be manufactured cheaply

Solution Advantages

- **Low-power**: can substantially reduce the power required by electronics to perform data exchange
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Potential Commercial Applications

- Sensors
- Radio location
- Telecommunications
- Consumer electronic devices
- Retail technology
- Internet of things

Background and More Information

Passive RFID tags may or may not have an onboard power supply and are attractive for being simpler systems and having lower costs. However, the range of these tags is much lower compared to active RFID tags, which have an on-board power supply. There is a need for a method to increase the distance in which data is transmitted and received using passive RFID tags without compromising the reliability.

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