Efficient neighbor discovery in low-power wireless networks

Technology #cu15281

This technology is a system for power-efficient neighbor discovery and synchronization in energy-harvesting wireless networks.

Unmet Need: Energy-efficient protocol for neighbor discovery in energy-harvesting wireless networks

Object tracking can be achieved by affixing ultra-low power wireless transmitters (nodes) to desired inventories, where neighboring nodes then communicate to exchange information. To minimize power consumption, the nodes are often set in a sleep mode, which presents synchronization challenges for discovering neighboring nodes. Current wireless communication systems are also too energy intensive to work efficiently with ultra-low power wireless network devices such as energy-harvesting nodes, which enable wireless communication between objects and devices that are not traditionally networked.

The Technology: Communication system with alternating operation states for minimized energy consumption

This system provides throughput enhancement in neighbor discovery among ultra-low power wireless network devices. The devices transmit and receive data by alternating between different operation states (e.g. listen, sleep, transmit) at a transition rate, enabling perpetual operation in energy-harvesting nodes. The wireless devices are able to discover the greatest number of neighboring devices without exceeding the energy that they harvest or are allocated.

This technology has been validated using a network of solar powered energy harvesting nodes.
Applications:

- Inventory tracking
- Internet of Things
- Smart buildings
- Intelligent transportation networks
- Healthcare devices

Advantages:

- Minimizes energy consumption
- Maximizes discover rate of neighboring nodes
- Tailorable to desired levels of power consumption
- Adaptable to numerous types of networks

Lead Inventor:

Dan Rubenstein, Ph.D.

Patent Information:

Patent Pending (US 20170019861)

Related Publications:

Tech Ventures Reference:

- IR CU15281
- Licensing Contact: Greg Maskel

Inventors

Dan Rubenstein