Docket #: S14-087

A method for short range wireless data communication using wireless powering

Stanford researchers at the Poon Lab have developed a method for battery-less, short range transmission of data with very low power and very high data rates. It can potentially replace current near field communications (NFC) systems due to these advantages. Compared to current NFC systems, this invention's power efficiency is at least two orders of magnitude higher, has a variable data rate up to 2500Mbps and a smaller antenna size, and longer range of communication. Currently, there are no commercially available battery-less systems that can communicate data at high rates.

Stage of Research

- **Prototype completed** - Demonstrated an integrated 2×2 OOK transceiver at 60GHz with energy harvesting transmitter (TX) and TX power scalable with data rate.
- Believed to be the first 60GHz transceiver with an energy harvesting TX.
- Continued research to demonstrate application for neural imaging.

Applications

- Can potentially replace current NFC systems due to its advantages
- Any application where a large or small amount of data is needed to be transferred wirelessly at very low power and at a short distance

Advantages

- **Battery-less system**

- **Higher data rate and significantly lower power consumption** compared to current NFC systems
- **Smaller antenna size** because the operating frequencies are higher
- **Longer range of communication**, greater than 10cm (maximum for NFC is 10cm)

Publications

- M. Taghivand, K. Aggarwal, Y. Rajavi, and A. S. Y. Poon, "An energy harvesting 2×2 60GHz transceiver with scalable data rate of 38-to-2450Mb/s for near-range communication," IEEE Journal of Solid-State Circuits, 50, 1889-1902 (2015).

Patents

- Published Application: WO2015172049
- Published Application: 20170237469
- Issued: 9,991,751 (USA)

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