INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

Multiple Access Wireless Power Transfer

TECHNOLOGY NUMBER: 2018-498

OVERVIEW

A technique that provides simultaneous wireless power transfer (WPT) to multiple devices

- Implements code division multiplexing to create orthogonal codes that maintain device separation
- Car charging, industrial electrical equipment, low-power light fixtures, and wearable devices

Background

Electronic devices increasingly permeate consumer markets, though the downtime and interference required by recharging these devices continue to limit their efficiency of use. Wireless power transfer (WPT) is a revolutionary technology that has the potential to favorably transform the way that machines and devices are powered. This approach involves the transfer of electrical energy from one device to another without the need for physical connections, such as cords or cables. Existing WPT technologies are used for charging of smartphones, tablets, and wearables, as well as the powering medical implants and charging electric vehicles. This technology offers many benefits, such as increased convenience, improved safety, and reduced clutter, making it an essential component of the future of power delivery. Still, WPT has been limited by the number of devices which may be charged at one time, so a need exists for continued improvements in the technology.

INNOVATION

Researchers have adopted reliable techniques from the field of wireless communications to enable concurrent high-capacity wireless power transfer (WPT) to multiple devices. Compared to existing technologies which are incapable of charging a small number of devices at the same time, this innovation permits multi access (MA) charging of hundreds of them. The process achieves MA WPT by implementing code division multiplexing (CDM) which functions by creating orthogonal codes to maintain separation between devices. The technology permits users to operate on the same frequency in simultaneous time and space to maximize scalability, limit electromagnetic interference, and permit higher tolerance to component variation. This high-device capacity therefore allows for the applications in fields such as high-capacity electric car charging stations, industry electrical equipment, low-power light fixtures, and wearable electronics.

PATENT APPLICATION

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Category
Hardware
Engineering & Physical Sciences
Semiconductor and Electronics

Author(s)
Akshay Sarin
Al-Thaddeus Avestruz
Xin Zan

Further information
Joohee Kim
jooheek@umich.edu

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