(SD2021-331) SyncScatter: Enabling WiFi like synchronization & range for WiFi backscatter communication

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OTHER INFORMATION

CATEGORIZED AS

- **Communications**
  - Wireless

RELATED CASES

2021-Z08-1

BACKGROUND

WiFi backscattering can enable direct connectivity of IoT devices with commodity WiFi hardware at low power. However, most existing work in this area has overlooked the importance of synchronization and, as a result, accepted either limited range between the transmitter and the IoT device, reduced throughput via bit repetition, or both.

TECHNOLOGY DESCRIPTION

Researchers from UC San DIego specifically built and prototyped SyncScatter to demonstrate the first fully-WiFi-compatible symbol-level synchronized, longdistance, extremely low-powered backscatter system. Furthermore, SyncScatter can support multiple IoT devices to co-exist without interfering with each other. SyncScatter is designed on a custom ASIC, enabling ultra-low-power (with an average power consumption of 30μW) which, together with a custom ASIC, achieves a range of 30+ meters and the peak throughput of 500Kbps.

APPLICATIONS

ADVANTAGES

Syncscatter encodes the IoT device data on the incident wifi signals and backscatters them as valid Wi-Fi signals. It detects and synchronizes to the incident signals using a novel wake-up receiver architecture that is compatible with the Wi-Fi standards. The developed IC can work with commercial off the shelf devices.

STATE OF DEVELOPMENT

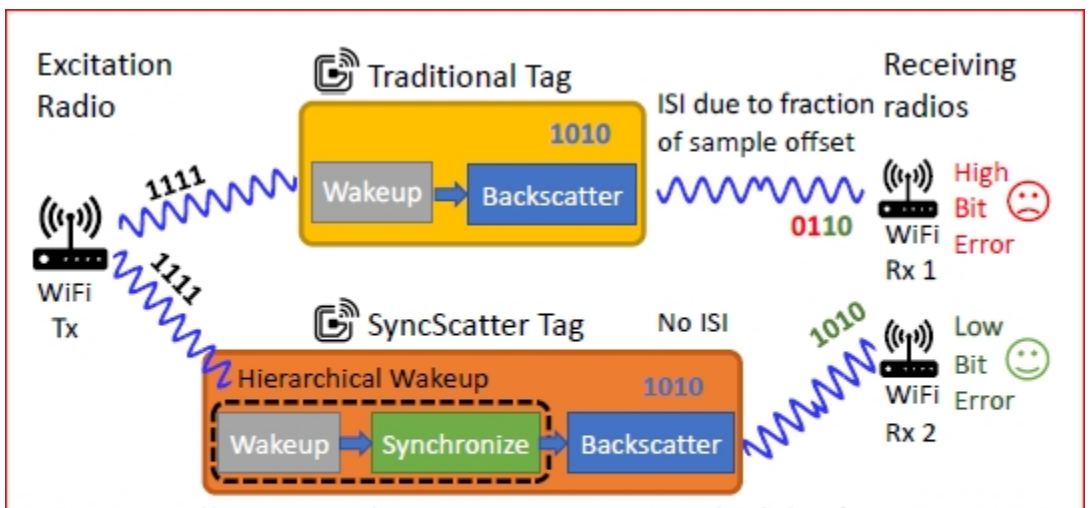


Figure 1: Shows a traditional tag form [40] which backscatter signal without accurate synchronization, leading to higher BER. In contrast the SyncScatter tag accurately synchronizes to the incoming signal.

INTELLECTUAL PROPERTY INFO

This patent-pending invention is available for commercialization. Please contact UC San Diego for licensing terms.

RELATED MATERIALS

- Manideep Dunna, Miao Meng, Po-Han Wang, Chi Zhang, Patrick Mercier, and Dinesh Bharadia. SyncScatter: Enabling WiFi like synchronization and range for WiFi backscatter Communication. Proceedings of the 18th USENIX Symposium on Networked Systems Design and Implementation. April 12–14, 2021 - 04/12/2021

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