A Distance-Immune Low-Power Inductively-Coupled Bidirectional Data Link

Tech ID: 29410 / UC Case 2017-776-0

SUMMARY

UCLA researchers in the Department of Electrical Engineering have developed a distance-immune wireless data link for monitoring data in biomedical implants.

BACKGROUND

Wireless power transfer and data communication in biomedical implants is a new method for continuously monitoring brain/body activities. The biomedical implant relays data to a unit outside the human body (uplink direction) and can receive commands or control information in the reverse direction (downlink direction). The data link should be bidirectional, consume very low power inside the body, have enough bandwidth to transfer recorded data from multiple channels and be insensitive to the distance between the external unit and implant. Although the latter feature has been overlooked, distance is highly prone to change due to patient movements and different surgical placements.

INNOVATION

UCLA researchers have developed a distance-immune bi-directional half-duplex wireless data link for monitoring data in biomedical implants. By employing a novel approach based on a free-running oscillator tuned by coupled resonators, immunity to distance variation (within limits) is achieved while meeting all other requirements. This invention alleviates the modulation index change with coils distance variation. Therefore, variations in patient movement and surgical placements will not disrupt data monitoring in biomedical implants.

APPLICATIONS

- Biomedical Telemetry
- Radio-Frequency Identification
- Near Field Communication
- Internet of Things

ADVANTAGES

- Alleviates modulation index change with coils distance variation
- Variations in patient movement and surgical placements do not disrupt data monitoring in biomedical implants

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11063637	07/13/2021	2017-776

RELATED MATERIALS

- Yousefi, A., Yang, D., Abidi, A.A., and Markovic, D., A distance-immune low-power 4-Mbps inductively-coupled bidirectional data link, 2017 Symposium on VLSI Circuits, 2017.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Scalable Parameterized VLSI Architecture for Compressive Sensing Sparse Approximation
- Autonomous Thermoelectric Energy-Harvesting Platform for Biomedical Sensors

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OTHER INFORMATION

KEYWORDS

Distance-immune, inductively coupled link, wireless data communication, biomedical implants, bi-directional, half-duplex wireless data link, uplink direction, free-running oscillator

CATEGORIZED AS

- **Biotechnology**
  - Bioinformatics
- **Communications**
  - Wireless

RELATED CASES

2017-776-0

- Electrode Agnostic, Supply Variant Stimulation Engine For Implantable Neural Stimulation
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