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Cooperative Jamming for Implantable Medical Device Security

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Abstract : Implantable medical devices (IMDs) are medically necessary devices embedded in the human body that monitor chronic disorders or automatically deliver therapies. Most IMDs have wireless capabilities that allow them to share data with an offboard programming device to help medical providers monitor the patient's health while giving the patient more insight into their condition. However, serious security concerns have arisen as researchers demonstrated these devices could be hacked to obtain sensitive information or harm the patient. Cooperative jamming can be used to prevent privileged information leaks by maintaining an adequate signal-to-noise ratio at the intended receiver while minimizing signal power elsewhere. This paper uses ray tracing to demonstrate how a low number of friendly nodes abiding by Bluetooth Low Energy (BLE) transmission regulations can enhance IMD communication security in an office environment, which in turn may inform how companies and individuals can protect their proprietary and personal information.

Keywords : implantable biomedical devices, communication system security, array signal processing, ray tracing
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