

Leveraging Li-Fi to Enhance Security and Performance of Medical Devices

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Abstract : The network connectivity of medical devices is increasing at a rapid rate. Many medical devices, such as vital sign monitors, share information via wireless or wired connections. However, these connectivity options suffer from a variety of well-known limitations. Wireless connectivity, especially in the unlicensed radio frequency bands, can be disrupted. Such disruption could be due to benign reasons, such as a crowded spectrum, or to malicious intent. While wired connections are less susceptible to interference, they inhibit the mobility of the medical devices, which could be critical in a variety of scenarios. This work explores the application of Light Fidelity (Li-Fi) communication to enhance the security, performance, and mobility of medical devices in connected healthcare scenarios. A simple bridge for connected devices serves as an avenue to connect traditional medical devices to the Li-Fi network. This bridge was utilized to conduct bandwidth tests on a small Li-Fi network installed into a Mock-ICU setting with a backend enterprise network similar to that of a hospital. Mobile and stationary tests were conducted to replicate various different situations that might occur within a hospital setting. Results show that in room Li-Fi connectivity provides reasonable bandwidth and latency within a hospital like setting.

Keywords : hospital, light fidelity, Li-Fi, medical devices, security

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