A Review on Electronic Device Detection Systems Using Wireless Signal Technologies

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Abstract

The detection of concealed electronic devices has become essential in various security-sensitive environ-ments such as defense zones, corporate premises, and public infrastructures. As electronic gadgets have evolved to become smaller and more powerful, the challenge of detecting their presence has intensified. In recent years, several detection systems based on electromagnetic field (EMF) and radio frequency (RF) emissions have been designed and implemented. In this review, prominent methods have been analyzed, including low-power RF detection using optoelectronic oscillators, EMF detection via smartphones, and signal optimization techniques for real-time alerts. Each approach has been evaluated on parameters such as accuracy, portability, power efficiency, and scalability. Comparative insights and technological gaps have been presented to identify areas for further improvement. The review concludes with a discussion on the future of integrated and intelligent systems for advanced electronic device detection.

Keywords

Bluetooth tracking, electronic device detection, emf analysis, rf emissions, optoelectronic oscillator, signal surveillance.