WIRELESS PHYSICAL LAYER SECURITY: PART 1
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Wireless Physical Layer Security: Part 1

The ongoing paradigm shift from classical centralized wireless technologies toward distributed large-scale networks such as the Internet of Things has introduced new security challenges that cannot be fully handled via traditional cryptographic means. In such emerging wireless environments, devices have limited capabilities and are not controlled by a central control center; thus, the implementation of computationally expensive cryptographic techniques can be challenging. Motivated by these considerations, substantial recent research has been investigating the use of the physical layer as a means to develop low-complexity and effective wireless security mechanisms. Such techniques are grouped under the umbrella of physical layer security. These techniques range from information-theoretic security, which exploits channel advantages to thwart eavesdropping, to physical layer fingerprinting techniques that exploit physical layer features for device identification. In this context, providing state-of-the-art tutorials on the various approaches to physical layer security is of considerable interest. This Feature Topic gathers together such tutorial-style and overview articles that provide an in-depth overview of the broad spectrum of security opportunities brought forward by physical layer security.

This Feature Topic is composed of two parts; the second part is expected to appear in the December issue of this magazine. Part 1 begins with an opening editorial by Trappe that exposes the current and future potential of wireless physical layer security, including an edited book, Physical Layer Security in Wireless Communications (CRC Press). He serves as an Editor for IEEE Transactions on Wireless Communications and IEEE Communications Letters.

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BIOGRAPHIES