

Masters Theses 1896 - February 2014

Off-campus UMass Amherst users: To download campus access theses, please use the following link to [log into our proxy server](#) with your UMass Amherst user name and password.

Non-UMass Amherst users: Please talk to your librarian about requesting this thesis through interlibrary loan.

Theses that have an embargo placed on them will not be available to anyone until the embargo expires.

Wireless Physical-Layer Security Performance of UWB systems

[Download](#)

[SHARE](#)

[Miyong Ko, University of Massachusetts Amherst](#)

[Follow](#)

Document Type
Open Access

Degree Program
Electrical & Computer Engineering

Degree Type
Master of Science in Electrical and Computer Engineering (M.S.E.C.E.)

Year Degree Awarded
2011

Month Degree Awarded
September

Keywords
UWB, security, wireless, physical layer

Abstract
Traditionally, spread-spectrum systems have been employed to provide low probability-of-intercept (LPI) and low probability-of-detection (LPD) performances at the physical layer, but the messages transmitted over such a system are still encrypted with a powerful cipher to protect their secrecy. Our challenge is to find a solution to provide an additional level of security at the physical layer so that simple systems such as RFID tags with limited resources can be secure without using standard encryption. It has recently been suggested that the cryptographic security of the system can be enhanced by exploiting physical properties of UWB signals. With an eavesdropper observing the communications over multipath channels between two legitimate partners sharing a secret key of a limited length, we consider both coherent and reference-based UWB schemes to enhance security. The security of the legitimate nodes is achieved by signal attributes based on the secret key, conferring an advantage over the adversary. We propose UWB signaling schemes to

Enter search terms:

in this series

[Advanced Search](#)

 [Notify me via email or RSS](#)

[Browse](#)

[Collections](#)

[Disciplines](#)

[Authors](#)

[Author Corner](#)

[Author FAQ](#)

[Links](#)

[University Libraries](#)

[UMass Amherst](#)

[Contact Us](#)



improve physical layer security when the transmission is intended for coherent reception and TR reception. Among possible improvements, we consider removing the frame structure of the UWB coherent signaling scheme, resulting in pulses that can be located anywhere in the symbol period. Our proposed signaling schemes could potentially suggest a solution for applications relying on conventional cryptography, especially for low-data rate RFID systems.

Advisor(s) or Committee Chair
Goeckel, Dennis L



This page is sponsored by the [University Libraries](#).

© 2009 [University of Massachusetts Amherst](#) • [Site Policies](#)

 DIGITALCOMMONS[®]
powered by bepress