

## ABSTRACT

**Duarte**, Adriane dos Santos. *Watermarking in visible light communication systems based on ACO-OFDM modulation*. xx f. Dissertação (Mestrado em Engenharia Eletrônica) - Faculdade de Engenharia, Universidade do Estado do Rio de Janeiro (UERJ), Rio de Janeiro, 2021.

The radiofrequency (RF) watermark is a technology that incorporates hidden information into conventional communication signals without the use of extra bandwidth. The confidential information may be used for authentication purposes or to transmit confidential data. Therefore, the watermark provides a way to authenticate users in a secrecy/confidential manner, and one may add authentication in the physical layer to wireless protocols without breaking client protocols. In the first part of this dissertation, one analyzes the performance of using watermark in BPSK and QPSK modulation schemes through theoretical and simulated bit error rate (BER) curves for the watermark and the message depending on the signal-to-noise ratio (SNR). In the second part, as an unprecedented contribution, one proposes using the watermark techniques analyzed in the first part in visible light communication (VLC) systems based on OFDM multipoint modulation (Orthogonal Frequency Division Multiplexing). In this context, for performance comparison, the simulated BER curves for the watermark and the message, depending on the signal-to-noise ratio (SNR), are obtained. Thus, it was possible to conclude that the model presented for the simulation of the watermark in the VLC system has its performance associated with the non-linear effect, which is an inherent characteristic of LED lamps.

Keywords: Watermarking, VLC, LED, BPSK-OFDM, QPSK-OFDM.