

UNIVERSITY OF SOUTH FLORIDA

Defense of a Doctoral Dissertation

Secure Lightweight Cryptographic Hardware Constructions for Deeply Embedded
Systems

by

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Lightweight cryptography plays a vital role in securing various resource-constrained embedded systems, including deeply-embedded systems, implantable and wearable medical devices, smart homes, RFID tags, sensor networks, and privacy-constrained usage models. However, the security of these systems can be compromised by fault analysis attacks, a type of side-channel attack. This dissertation presents novel cryptographic hardware constructions for resource-constrained embedded systems, including deeply-embedded systems, implantable and wearable medical devices, smart homes, RFID tags, sensor networks, and privacy-constrained usage models. The dissertation is organized as follows: Chapter 1: Introduction. Chapter 2: Preliminaries. Chapter 3: Fault Analysis Attacks. Chapter 4: Fault Analysis Attacks on Stream Ciphers. Chapter 5: Fault Analysis Attacks on Block Ciphers. Chapter 6: Fault Analysis Attacks on Authenticated Encryption. 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