Week 5 Hardware Trojan Detection and Trusted ID Design

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Overview

This week we study hardware Trojan and trusted integrated circuit (IC) design. Hardware Trojans are additions or modifications of the circuit with malicious purposes. It has become one of the most dangerous and challenging threats for trusted ID design. We will give hardware Trojan taxonomies based on different criteria, explain how hardware Trojan work, and then talk about some of the existing approaches to detect them. We define trusted IC as circuit that does exactly what it is asked for, no less and no malicious more. We will illustrate this concept through the design space analysis and we will discuss several practical hardware Trojan prevention methods that can facilitate trust IC design.

Learning Objectives

After the completion of this week, you will be able to:
- understand various kind of hardware Trojan and how they work
- know the popular hardware Trojan detection approaches
- study several practical methods for hardware Torjan prevention
- expose the concept of trusted integrated circuits and how to build trust in ICs

Video Lectures

- Hardware Trojan (HT) and Trusted IC (17'52") PDF
- Hardware Trojan Taxonomy (16'01") PDF
- Hardware Trojan Detection Overview (17'18") PDF
- Hardware Trojan Detection Methods (13'45") PDF
- Trusted IC Design with HT Prevention (17'06") PDF

Readings

- R. Karri, J. Rajendran, and K. Rosenfeld, "Trojan Taxonomy", in *Introduction to Hardware Security and Trust*, pp. 325 - 338, Springer, ISBN 978-1-4419-8079-3, 2012.
- S. Narasimhan and S. Bhuni, "Hardware Trojan Detection", in *Introduction to Hardware Security and Trust*, pp. 339 - 364, Springer, ISBN 978-1-4419-8079-3, 2012.
- Y. Jin, E. Love, and Y. Markris, "Design for Hardware Trust", in *Introduction to Hardware Security and Trust*, pp. 365 - 384, Springer, ISBN 978-1-4419-8079-3, 2012.
- References on the lectures slides.

Discussions

Click here to view the Week 5 Discussion Questions.

Quizzes

Click here to take the quiz.

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