Week 1 Digital System Design: Basics and Vulnerabilities

Help Center

Digital System Design: Basics and Vulnerabilities

To learn hardware security, we first need to learn how hardware is designed. This week's lectures give an overview of the basics on digital logic design, which is a semester-long course for freshmen and sophomores in most schools. By no means we can cover all the materials. What we provide here is the minimal set that you need to understand about digital design for you to move on to learn hardware security.

For those who have learned digital logic design, this can be a quick warm-up, but you may still find some of the quiz questions quite challenging. For those who do not have this background or want to learn more on design, any textbook on digital logic design or the coursera course "VLSI CAD: Logic to Layout" offered by Prof. Rutenbar can be a good starting point.

If you have not done yet, please complete the Course Welcome Survey. We are interested in learning more about you and why you are taking this course. Thank you for sharing your perspectives.

Learning Objectives

After the completion of this week, you will be able to:

- understand how digital system is specified, implemented, and optimized
- learn what are sequential systems and how they are designed

- identify the don't care conditions introduced during the design process
- know that there exist security and trust vulnerabilities in hardware

Video Lectures

- Introduction (5'17") PDF
- Digital System Specification (10'02") PDF
- Digital System Implementation (9'21") PDF
- Function Simplification and Don't Care (10'00") PDF
- Sequential System Specification (8'36") PDF
- Sequential System Implementation (7'21") PDF
- Vulnerabilities in Digital Logic Design (12'04") PDF

Discussions

Click here to view the Week 1 Discussion Questions.

Quizzes

Click here to take the quiz.

Created Tue 29 Apr 2014 9:43 AM PDT

Last Modified Sat 3 Jan 2015 10:03 AM PST