

Lecture Plan Overview

Design and Verification of Security Protocols and Security Ceremonies

Programa de Pós-Graduação em Ciências da Computação
Dr. Jean Everson Martina

March-June 2018



Course Identification

- INE 410128 - Design and Verification of Security Protocols and Security Ceremonies

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- 3 credits – 45 hours

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About the Lecturer



- B.Sc. In CompSci;

About the Lecturer



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- M.Sc. In CompSci;

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- Several International Projects;

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- B.Sc. In CompSci;
- M.Sc. In CompSci;
- Ph.D. In CompSci;
- Several International Projects;
- Working on Cryptography, Digital Signatures, Security Protocols and Security Ceremonies.

About the Students

I would like to know:

- Your Name and Affiliation;

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I would like to know:

- Your Name and Affiliation;
- Academic Background;
- Interests in Security;
- Prior knowledge on Security;
- Anything else you believe is important to share.

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- Some prior familiarity with formal methods may be helpful;
- All necessary background will be covered in class.

Study Aims

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- Protocol Verification Techniques;
- Advanced Security Protocols;
- Advanced Security Ceremonies;
- Formal Verification of Security Protocols and Security Ceremonies.

General Objective

Understand the concepts of security protocols and security ceremonies design and verification.

Specific Objectives

- Understand security primitives as a way of yielding security;

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- Understand the relation between the different security properties and their compositions;

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- Understand security primitives as a way of yielding security;
- Understand the relation between the different security properties and their compositions;
- Review classical security protocols;
- Understand the different threat models available for symbolic evaluation of security protocols and security ceremonies;

Specific Objectives

- Understand the security verification techniques available today;

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- Understand the security verification techniques available today;
- Study advanced security protocols;
- Study advanced security ceremonies;
- Be able to apply formal verification techniques based on theorem provers on security protocols and security ceremonies.

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Methodology

- The first part of the course will survey contemporary security protocols and their properties, including confidentiality, authentication, secure group communication, privacy, and anonymity.

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- We will also cover cryptographic primitives, as well as standard formal models and tools used for mechanized verification of secure systems.

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- Coming up with a security specification for a particular system and performing a detailed analysis of its properties; or
- Extending an existing tool or method to support analysis of a new class of security properties; or
- Conducting a theoretical study of the relationship between several models.

Studying Strategies

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- The off-class workload for this course is about 90 hours;
- Some lectures will be open discussions regarding the topics.

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- Lectures will be given in English;

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- All the meetings will be recorded;

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- All the meetings will be recorded;
- This Course follows all UFSC regulations regarding regular courses.

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- The technical report will be assessed using standard strategies used to evaluate conference papers;
- The technical reports will be evaluated over their readability, adherence to the proposed topic, contribution, coherence of the experimentation conducted and the results achieved;
- Technical reports with a pass mark should be fit for submission to the main conferences in the area of security protocols, formal methods or foundations of computer security.

Schedule

- Tuesday 13:00-15:30 (BRT)

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- International participants should be aware that:
 - Time shifts during the semester
 - Your summer time will start (usually +1 hour);
 - Brazil is already out of summer time, so no time shift for us;

Bibliography

- Formal Correctness of Security Protocols. Bella, G.. 2007. Springer
- Threat Modelling: Designing for Security. Shostack, A.. 2014. Wiley
- Isabelle/HOL: A Proof Assistant for Higher-Order Logic. Nipkow, T. and Paulson, L.C. and Wenzel, M.. 2003. Springer Berlin Heidelberg

Questions????



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