

COMP 7/8998 – Security and Privacy in Cloud and Internet of Things

Instructor:

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Lectures: TR 1:00 – 2:25 pm | DH 101

Office Hours: By appointment

Course Website: <http://www.cs.memphis.edu/~kanyang/COMP7:8998-fall19.html>

Course Description:

This course introduces the security and privacy issues in cloud computing and Internet of Things. It covers advanced cryptography (Identity-based Encryption, Attribute-based Encryption, Searchable Encryption, Order-preservation Encryption) and its applications in solving security and privacy issues in cloud computing and Internet of Things. (The content and syllabus are subject to adjustment during the semester.)

Course Objectives:

The main goal of this advanced course is to learn advanced cryptography and understand how these cryptographic primitives can be applied to protect the security and privacy in cloud computing and Internet of Things. Specific objectives include: a) understand advanced cryptographic primitives; b) understand the critical security and privacy issues in cloud computing and IoT and their challenges; c) able to identify some security and privacy problems in some cutting-edge research areas.

Course Requirements:

Prerequisites: COMP7/8120.

Additional Requirements on COMP 8998: Compared to the COMP 7998, students who enrolled in COMP 8998 are required to include more technical details during the in-class presentations.

Recommended Texts (not mandatory):

- [A Graduate Course in Applied Cryptography](#) by D. Boneh and V. Shoup. Free!

Evaluation:

Grading: Your final grade will come from the following sources: class attendance (CA), in-class presentations (IP), term project (TP). Here is the grading formula:

$$Grade = 0.1 * CA + 0.5 * IP + 0.4 * TP$$

Grading Scale: A: 85 – 100, B: 70 – 84, C: 60 – 69, D: 50 – 59, F: 49 and below. (Plus/minus grading will be used).

Course Policies:

- **Late Policy:** Without prior request, no late work will be accepted. All late submission maybe accepted at a penalty of 15% per day for no more than THREE days.
- **Project Report Policy:** It is recommended that students use a word processing software (e.g., Word or LaTeX) to type project report, then submit well-formatted PDF files.

Disability statement:

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in Wilder Tower.

Plagiarism/Cheating Policy:

Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and will not be tolerated. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but appropriate references must be included for the materials consulted, and appropriate citations made when the material is taken verbatim.

If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to: <http://www.people.memphis.edu/~jaffairs/>

Your written work may be submitted to Turnitin.com, or a similar electronic detection method, for an evaluation of the originality of your ideas and proper use and attribution of sources. As part of this process, you may be required to submit electronic as well as hard copies of your written work, or be given other instructions to follow. By taking this course, you agree that all assignments may undergo this review process and that the assignment may be included as a source document in Turnitin.com's restricted access database solely for the purpose of detecting plagiarism in such documents. Any assignment not submitted according to the procedures given by the instructor may be penalized or may not be accepted at all.

Topics:

Introduction

Security and Privacy in Cloud Computing

- Secure and Scalable Data Outsourcing in the Public Cloud
- Privacy-Preserving Data Dynamic Auditing for Cloud Data

- Attribute-based Access Control for Data Outsourcing
- Efficient and Secure Search over Encrypted Data in Cloud

Security and Privacy in Internet of Things

- From Cloud to IoT – Fog Computing and Crowdsourcing
- Authentication in IoT
- Blockchain – An Introduction