

BLG459E: Computer Security

Fall 2018, Term Project

READ CAREFULLY ALL THE TEXT!

Assignment 1: Determine Project Groups

Due: 24.09.2018 (No extensions!)

You are expected to prepare a research paper about blockchain and/or its applications, such as:

- Applications Using or Built on Top of Blockchain
- The Bitcoin Protocol and Extensions
- Blockchain Applications that you may IMAGINE!
- Case Studies (e.g., of adoption, attacks, forks, scams, ...)
- Digital Cash and Payment Systems with Blockchain
- Distributed Ledgers Applications
- Cryptocurrencies
- Forensics and Monitoring with Blockchain
- Fraud Detection and Financial Crime Prevention with Blockchain
- Applications for Peer-to-Peer Networks with Blockchain
- Permissioned and Permissionless Blockchains
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Determine your research topic as soon as possible!

Expected and recommended stages of the term project for a group are as follows:

1. Determine your research topic
2. Literature review and analysis
3. Understand blockchain and your selected application area
4. Specify the problem you attack (you intend to solve)
5. Propose a solution related the selected problem. The solution may be
 - a. Protocol design
 - b. Architecture
 - c. Implementation
 - d. Formal model
 - e. Integration of existing mechanisms
 - f. ... simply new ideas! DO NOT LIMIT YOUR IMAGINATION!**
6. Prove your solution
7. Present your term project

Each group will consist of **1 student (you may complete your term project alone), 2, or 3 students**. Determine your group members (students) and submit the group information and your research area to Ninova until the end of **24.09.2018**. **Otherwise you will complete your term project alone!** *For more information about your project, read information provided in the following assignments!*

What to submit? You should submit your group information **Ninova** only. The group information should consist of **İTÜ IDs** and **Names** of each group member. **Please do not send any information to my email!**

Assignment 2: Prepare your research paper (20 pts)

Due: 26.11.2018 (No extensions!)

You are expected to prepare your research paper in **IEEE conference paper format (not a journal paper nor a RFC nor a technical report format)**. You must read sources including **journal papers** that have been published **since 2017**. You should carefully explain your understanding of papers you read **by using your own words/sentences (Use your own English even it is broken!)**.

Your research paper must have at least the following sections:

- 1) Title, authors, address of the author, email address (Authors are you..!)
- 2) Abstract (max 100 words)
 - I. Topic of your work
 - II. What is the problem?
 - III. Solution: explain your solution briefly
 - IV. Results, contribution(s) of the your work
- 3) Introduction (what is the subject, the importance of the subject, what has been done in your paper)
 - I. What is the subject (Detailed explanation of the topic and problem)?
 - II. The importance of the subject?
 - III. What has been done in your paper? (Research, experiments,...)
 - IV. Contribution(s). (Your paper should have one to three contributions.)
- 4) Related Work (Find a specific name for the title of this section, such as "Intrusion Detection and Blockchain")
 - I. Who has done work in this area?
 - II. Areas that inspired this work.
 - III. Motivate the current work (your work).
 - IV. Differentiate your work from past works.
- 5) Proposed solution: *(Write a specific name for your solution, which will closely related to the topic of your paper, such as Management of Intrusion Information over Blockchain)*
 - I. You may explain the solution mathematically
 - II. Algorithmically,
 - III. With implementation, or
 - IV. In any other way.
- 6) Analysis of your proposed solution
 - I. Empirically that means implementation or simulation (I recommend)
 - II. Analytically (I do not recommend since it requires advanced mathematics knowledge!)
 - III. Observational

IV. Or simply by comparisons. (if you are not able to do any of above four methods)

7) Conclusion and Future Work (Problem, Solution, Contributions)

Briefly explain the topic and the problem. Give short information about your solution. Clearly write your achievement(s) (contribution(s) of the paper). List potential future works related to your specific research topic.

8) References: Your paper should contain at most 12 or 16 references (journal, conference, book, ..).

You have to cite at least 5 journal papers have published since 2017.

You must obey following rules when preparing your paper:

For format: http://www.ieee.org/conferences_events/conferences/publishing/templates.html

Your paper should be **between 5 and 6 pages (at least 5 full pages or 6 pages!)**

What to submit? You should submit your research paper (in “*.doc or *.docx” format, not pdf or any other), journal papers read, all in a zip file to **Ninova** only. Names of the files have to be as follows:

Journal paper: *NameOfThePaper, such as SecurityOfDigitalWalletsOnBlockchain*

Zip file: *GroupNo, such as Group2.zip (I will announce the group Nos.)*

Do not send any material including your research paper to me by email!

Assignment 3: Prepare a presentation as a group (after presentation 10 pts)

Due: 10.12.2018 (No extensions!)

Prepare a presentation about your term project. The presentations should contain the following information:

- Give general information about your topic
- Emphasize main problems
- Explain and defend your solution (design)
- Provide potential challenges
- The presentation should be **no more than 10 pages** (max 10 minutes for oral presentation)

Note that you can update your presentation until the time slot you will receive!

What to submit? You should submit your presentation (in ppt format) to **Ninova** only.

Do not send any material to me regarding the presentation!

Assignment Optional: Conference Paper

You may receive additional points for your final grade if your paper is submitted after my revision!

Paper that may be submitted:

1. After I examine your written papers, which you will submit according to assignment 2, I will inform those groups that have potentials to be accepted from a conference!
2. Or if you particularly want to publish a paper related to topics of this course, come to my office to discuss the roadmap!

Prepare **a conference paper** about **a problem** related to your research project in **IEEE conference paper format (not a journal paper nor a RFC nor a technical report)**. **The paper will be a complete paper of your term project or an extension of your term project.**

For format: http://www.ieee.org/conferences_events/conferences/publishing/templates.html

You must obey following rules when preparing your paper:

- a) You may prepare your paper **alone or as a group.**
 1. If you prepare the paper alone, you should modify (rewrite) all materials of the term paper.
 2. Otherwise (if you prepare the paper with group members), you may use materials of your term paper.
- b) Use **your own English** even it is broken!
- c) Your paper should **not exceed 6 pages.**
- d) I will review and modify papers which are eligible for submission to a conference. Then, I will submit these papers to a conference. Therefore, put my name as the last author of your paper!