

CS 451: Project

Proposal Due: October 29, 2021

Project Due: November 29, 2021

1 Overview

Throughout CS 451: Computer Security we have discussed technologies used to create secure computer systems and the context behind what is being secured from whom.

The project is a chance to produce novel knowledge regarding computer security with respect to both technology and context, and present this knowledge to your peers for feedback. It will allow you to apply the knowledge learned in this course collaboratively and create a portfolio piece to demonstrate your knowledge to the broader society.

To do so, form a group of 2-4 students (or seek instructor approval) and organize around a high level goal in one of three primary directions:



Propose a (Ethical) Attack Create a new Secure Service Support Your Communities

Identify an entity suitable for attack on ethical grounds and propose a technique to attack that entity. You may consider liveness/availability, confidentiality, integrity, or any relevant security agreements.

Identify an unmet need within your community for which secure computing offers or facilitates redress. Using either existing technologies or novel technologies you implement, construct a proposed solution.

Identify a demonstrate a knowledge gap related to computer security within your community, such as students or Salem-anders. Develop and propose a measurable deployment of an educational intervention.

2 Proposal

By October 29, 2021, provide the course instructor with a one page document outlining your proposed project. This should be an approximately one page document that outlines:

- The members of your project group
- A high level description of the project
- The relevance to computer security
- How to measure the success of your project
- Available time outside of class to meet with the instructor to discuss the proposal.

Each project group should submit one written proposal via email no later than 11:59 PM on October 29.

Additionally, each group will be responsible for leading one day of class and should provide:

- A relevant proposed reading or presentation to discuss in class
- Example midterm questions for Midterm II

3 Student Driven Learning

After October 29, the next six classes (Nov. 1, 3, 5, 8, 10, 11) are reserved for discussing student topics. Each group will be responsible for directing class one of these six days to familiarize the instructor and your peers with relevant topics to your project, as well as get an opportunity to receive helpful feedback (unhelpful feedback will not be permitted). These may either be humanities oriented discussions, systems driven demonstrations, or theory driven presentations and discussion.

Given the nature of preparing systems and theory classes, these proposals will be given priority for the second week of student topics.

4 Project Presentation

The week of November 29 will be set aside for project presentations. For your presentation, prepare a workshop/conference-style 15 minute presentation and be prepared for 10 minutes of questions. In accordance with the recent trend in conference and workshop presentations, ensure that your presentation could be delivered remotely.

For some helpful examples of what a 15 minute presentation may look like, USENIX, a leading industry organization in computer systems research, has helpfully open-sourced all of their security conferences at <https://www.youtube.com/channel/UC4-GrpQBx6WCGwmwozP744Q>.

5 Project Paper

Create a document in workshop/conference style summarizing your findings and the outcome of your project with a length between four and six pages excluding appendices, which may be of any length. You may wish to include:

- An abstract
- An introduction, situating your project within the field as you see it
- A background section, introducing concepts relevant to your project
- A methodology section, stating your approach to the project
- An implementation section, saying how you put your methodology into practice
 - Consider how your project could be reproduced by other researchers
- A results section, summarizing how you measure your project against its original goals
- A discussion section, addressing anything that doesn't fit well elsewhere
- A related work section, connecting your project to other research and efforts
- A conclusion, to summarize and organizing your results

Please format your project documentation using an established template from computer science research, such as

- The ACM <https://www.acm.org/publications/proceedings-template>
- The IEEE <https://www.ieee.org/conferences/publishing/templates.html>
- USENIX
<https://www.usenix.org/conferences/author-resources/paper-templates>.

If you need help with the templates, ask the course instructor. Overleaf is one helpful online tool.

Example workshop/conference papers can be found through the library or directly from researchers who open source their work such as USENIX or personal websites:

- <https://cd-public.github.io/papers/byYear.html>
- <https://www.cs.unc.edu/~csturton/publications.html>
- <https://kastner.ucsd.edu/publications/>

Examples of student work on projects can be found at <https://github.com/cd-public/cd-public/tree/master/projects>. While completed at graduate level, these projects were undertaken by smaller groups, so may still offer a helpful point of comparison.