COMP 430/530 – Fall 2023
General Information About Course Projects

The course project enables students to specialize in a privacy or security-related topic of their own choice. We are looking for course projects that require you to do **research**, i.e., your project should go beyond what is taught in class and/or reproducing a homework assignment. Think of it as a toy research project – it should contain some novelty in terms of idea, design, development, analysis, and/or experimentation.

Students are encouraged to pick a project topic that relates to their personal expertise and interests. The instructor will suggest sample project topics. Students are welcome to choose from the sample topics or come up with their own project topic. Topics that are not directly covered in the course can be fine, but they must have some connection to the course themes. If you are in doubt, ask the instructor.

Students are encouraged to discuss one-on-one with the instructor to define a suitable and exciting project. Course projects will be due in the second week of finals.

Projects will be done in groups of **at most 5 students**. We recommend groups of size 3-5. Note that more work will be expected from larger groups (e.g., 5 students) compared to smaller groups (e.g., 3 students).

According to the course syllabus, the course project is worth 25% of your overall grade. This is composed of the following parts:

- Project proposal (5%)
- In-class project presentation (5%)
- Final project report and deliverables (15%)

The “style” of your project can fall under one or more of these categories:

- Implementation: Create a usable tool, mobile application, web application, etc. that leverages some techniques/methods you learned in this course.
- Benchmarking: Consider multiple different solutions to a certain problem (e.g., multiple anonymization algorithms, multiple LDP protocols). Experimentally compare these solutions under different conditions (different datasets, problem sizes, metrics, etc.).
- Algorithm design: Design and develop a new privacy algorithm (a new anonymization algorithm, a new DP/LDP protocol, etc.) in a domain or problem of your choice.
- Application: Take an existing privacy approach (e.g., DP/LDP) and apply it in a novel context, e.g., healthcare, genomics, education, IoT, AI/ML.

Projects that do not contain any coding/development (e.g., projects that consist only of reading papers and writing a summary/survey) will not be accepted.

The course project is meant to be innovative and enjoyable for you. It is intentionally left open-ended to give you experience in working on a small research project, e.g., searching for relevant publications and resources, reading and learning by yourself, defining and solving a research problem. Promising projects may be extended to future semesters for research credits (e.g., Independent Study), publications, etc. Talk to the instructor if you are interested.

Proposal Guidelines

You should follow the template below when preparing your project proposal. Proposals should be **between 2-3 pages** long, written in a standard font (Times New Roman, Arial, etc.), size 10-12, single-spaced, and with standard page margins on the sides (1 inch). Images, figures and tables are highly encouraged; sometimes a figure or table is worth a thousand words. Make sure they are appropriately sized (not too large and not too small). **The proposal document should look professional overall.**

To ensure fairness for everyone, we will NOT read or grade any part of the proposal that exceeds the page limit (3 pages).

Bibliography (list of references) and Appendices are not included in the page limit. You can use as many pages as you wish for these two sections. Appendices should be used only for supplementary material that may help the reader's understanding, e.g., screenshots, detailed explanations, mathematical derivations, diagrams, etc. You should not use appendices for explaining the core concepts of your project – the project proposal should be self-contained and intelligible without appendices.

Do your research BEFORE writing your proposal. The proposal should concretely demonstrate that you are knowledgeable and resourceful in the project area. Also, make sure that your project is feasible to finish by the submission deadline (second week of finals).

Proposals should contain the names of all group members, but only ONE group member should submit the proposal on behalf of the whole group via Blackboard. This is to avoid duplicate submissions or different versions of the same proposal being submitted by different group members.

Common reasons why people lose points in the proposal (not a complete list):

- The proposal contains factually incorrect statements.
- The project does not go beyond reproducing an algorithm/technique that was learned in class, e.g., it looks like a homework assignment.
- The proposal does not convince the reader that background research (i.e., research that should have been done before writing the proposal) has been done. For example, you should not say: "We will find datasets with XYZ property". You should have found those datasets and you should be providing their links in your proposal.
- The proposal lacks a concrete action plan. For example: "First, we will do X. Then, we will do Y. Then, we will combine X and Y to come up with Z, ..." is a good action plan.
- The motivation behind your project is unclear. For example, the significance of your project goal is not stated or backed up by evidence.
- Proposal contains careless mistakes or looks unprofessional. There can be several indicators for this, such as grammatical errors, unreadable or copy/pasted figures or equations, inconsistencies in font, spacing, ...

Proposals may be implicitly "curved" when grading. Few strongest proposals will receive 5/5. The instructor expects class average to be between 3-4 out of 5.

********** START PROPOSAL PAGE LIMIT **********

PROJECT TITLE

List of group members' names

SUMMARY

1-2 paragraph summary of your project. This section is typically written last.

MOTIVATION AND PROBLEM STATEMENT

Describe clearly the problem that your project will be studying. Convince the reader that:

- The problem is interesting and/or timely (make the reader excited)
- The problem is sufficiently challenging and contains some novelty
- The problem has intellectual and/or societal value
- The problem will require you to build an in-depth understanding of a certain aspect of data privacy and security

TECHNICAL APPROACH

This is probably the longest section of your proposal. Feel free to divide it into subsections.

This section should contain technical details about what you plan to do, i.e., **how will you solve the problem** you defined above? What methods will you use? Have you identified and accessed relevant resources? (Provide evidence.) What programming languages and platforms will you use? Will you use any open source libraries or tools?

You should do research in detail before writing this section. The way that you write this section should demonstrate that you are knowledgeable and resourceful in the area, and you have a concrete action plan for your project to be successful. If applicable, I recommend that you give your action plan as a step-by-step list, an algorithm, a flowchart, etc.

DELIVERABLES

A short section listing the deliverables you will create and submit by the end of the project. You should summarize your deliverables as a list (bullet points), such as:

- Project report: one-sentence explanation
- Source code of XYZ application: one-sentence explanation
- Video recording as a project demo: one-sentence explanation
- Etc.

TIMELINE

Include a table to give a tentative timeline for your project. Specify which group member will work on which task. An example table is below. You may or may not include a brief justification (1 paragraph) for time allocations, e.g., why is task X assigned longer time than task Y?

Task	Dec 11-17	Dec 18-24	Dec 25-31	...	Jan 22-26 (deadline)
Data pre-processing	John, Jane				
Coding the server software		John	John		
Coding the client mobile app		Jane			
Testing client-server communication			John, Jane		
...					
Writing final project report					John, Jane

********** END PROPOSAL PAGE LIMIT **********

BIBLIOGRAPHY

List of references you used or cited when preparing your project proposal. The bibliography does not count towards the page limit. Any citation format is accepted (MLA, APA, Chicago, etc.) as long as you are consistent. You will not receive points for getting the bibliography right, but you may lose points if you get it wrong, e.g., you do not cite your references (watch out for plagiarism!), your citations are incorrect/missing, etc.

APPENDICES

Appendices are optional. You can have one or more appendices (name them Appendix A, B, C or Appendix 1, 2, 3). They do not count towards the page limit. Appendices can be used to add supplementary material that may help the reader's understanding, e.g., screenshots, detailed explanations, mathematical derivations, diagrams, etc. You can put supplementary material in an appendix, and, in the main document, refer the reader to the appendix (e.g., you say: "More detail can be found in Appendix B.")