Group Project

This course involves a significant group project, which can be undertaken as either:

- Systematization of Knowledge (SoK):
  SoK projects involve a rigorous and in-depth survey, analysis, and synthesis of existing knowledge on a specific topic within Privacy-enhancing Technologies. The goal is to create a comprehensive and insightful understanding of the chosen area. You will establish a framework for the topic, extract key insights, and potentially conduct analysis or experiments as needed to support your findings. Potential topics might include:
  - Analysis of market makers in conventional financial markets and their evolution in the context of DeFi.
  - Examination of application and integration of LLMs (Large Language Models) and GPTs (Generative Pre-trained Transformers) with blockchain technology.
  - More SoK examples can be found at https://oaklandsok.github.io/

  The focus should be on emerging trends, practical application settings, notable threat models/adversary assumptions, technical/design challenges, and existing or potential countermeasures.

- Measurement/Empirical Study:
  These projects require you to establish a rigorous and repeatable methodology for studying a system or phenomenon related to privacy-enhancing technologies using empirical data. This often involves developing benchmarks, conducting experiments, and analyzing results to extract meaningful insights.
  - Empirical study of DeFi attacks.
  - Rethinking previous privacy-enhancing technologies through empirical evaluation (e.g., analyze the effectiveness of existing privacy protection mechanisms against new threats).

  The focus should be on establishing a repeatable methodology, gathering and analyzing data, identifying key metrics and questions for measurement, and extracting data-driven insights. Consider aspects like incentive structures, performance metrics (throughput, latency), security, and other system-level properties.

- New Design and Implementation:
  These projects involve creating a novel design or implementation of a privacy-enhancing technology, system, or application. This requires identifying a problem, proposing a new solution, implementing it, and evaluating its effectiveness.
  - New design for privacy-preserving financial services.
  - New approach for decentralized identity management.

  The focus should be on problem definition, innovative approach/solution, implementation, and evaluation of the solution's performance and benefits compared to existing approaches.

Submission Details

- Project Proposal: Submit ONE project proposal per group, clearly stating your chosen topic, group members with assigned tasks, and preliminary plans with weekly milestones.

- Final Report and Presentation: Each group must submit ONE final report and ONE copy of presentation slides, summarizing key points, findings, and ideas.
- Format: Use the provided template for the project proposal and final report (available on Canvas under Files).
- Submission Portal: Submit both report and presentation slides via Canvas.
- Identification: Include names and student IDs in the project proposal and final report, as per the template.
- Report Title Format: Use "CS6290_GroupID_ProjectTitle.pdf" (the group ID will be assigned after the submission deadline of the project proposal).
- Length Requirement: The report must be **at least 6 pages**, excluding references. Figures and tables are permissible.
- Submission Deadline:
    - Project proposal: March 16, 23:59, 2025.
    - Presentation slides: April 24, 23:59, 2025 (one day before the presentation).
    - Final report: April 27, 23:59, 2025.
    - Note: Late submissions will not be accepted.
- Presentation Schedule: Presentations will take in Week 12. Each group member should present his/her contributions to the project.

Proposal Grading Criteria

A proposal template form "CS6290-project-proposal.docx" is provided. The primary scoring criteria includes:

1. **Relevance/importance of problem** (30%)
   Articulate the project's significance and impact concisely, justifying its importance within the course and beyond (e.g., explain problem's value, real-world relevance, and connection to course concepts).

2. **Feasibility** (50%)
   Demonstrate a focused and achievable project scope within the given constraints (e.g., show realistic project scale, resource consideration, and manageable goals).

3. **Timeline realism** (20%)
   Present a concise, realistic weekly timeline with clear milestones and task assignments achievable within the project duration (e.g., detail weekly tasks, task ownership, and demonstrate time management).

Notice: Proposal scores will NOT affect your grade, but top teams get first choice of final presentation timeslots!

Project Report Grading Criteria (85%)

A report template "CS6290-project-template.pdf" is provided to guide you on report context and structure. Note that, the template is only for reference. **Your report may not be restricted to it.** In this project, we will use the following guidelines for grading purposes. Hopefully, all projects can be roughly mapped to the criteria below.

1. **Motivation** (15%)
   Clearly articulate the scope and significance of your project. Highlight key results and discoveries.

2. **Background on studied problem** (25%)
   Provide a thorough description of your chosen topic, tracing its origins and current research trends. Use visual aids like graphs for clarity.

3. **Results and finding** (25%)
   Present a detailed analysis of your findings, including literature study summaries, improvements, solutions, and any original insights (e.g., data analysis with tables and figures).

4. **Style and writing** (10%)
   Assessment will consider the overall quality of writing, grammar, and presentation.

5. **References** (10%)
   Adhere to established academic referencing standards (e.g., IEEE). Ensure that references are relevant, credible, and comprehensive, reflecting the depth and scope of your research.

Project Presentation Grading Criteria (15%)

1. **Slide quality** (5%)
   Slides should incorporate graphic novel elements such as layout, figures, or text, with specific panel or page references. Employ multiple colors and figures to underscore main points. Ensure legibility with sufficiently large print. Use bullet points, keywords, or short phrases for clarity and brevity.

2. **Oral presentation fluency** (5%)
   Deliver your presentation with minimal hesitation, ensuring clear communication of ideas.

3. **Correctness** (5%)
   The content of your presentation must accurately and clearly reflect the findings and arguments of your final report.

[1] IEEE citation guide: https://ieeeauthorcenter.ieee.org/wp-content/uploads/IEEE-Reference-Guide.pdf

Notice:

1. Without quotation or SIGNIFICANT paraphrasing, the use of ANY sentence from other people's work (e.g., paper, article, Internet document, etc), even with citation, in your report constitutes plagiarism. No exception. Paraphrasing needs to be significant. Trivial paraphrasing other people' sentences still constitutes plagiarism. Note that, all your reports will go through the Turnitin system for originality check.
2. Academic honesty when using the GenAI tools: GenAI tools are permitted for research, brainstorming, and improving writing style and clarity. You must acknowledge any use of AI. Generating the final report content using GenAI is NOT permitted. Your report must reflect your own original writing and analysis.