CS 656 : Research Project

Computer Networks (CS 456/656)
Fall 2025

September 8, 2025

1 Introduction

The project's goal is to help students gain research experience by undertaking an original research project. Throughout the term, students are encouraged to draw inspiration from top-tier networking conferences and workshops to identify relevant and timely research areas. Your project should be grounded in a strong understanding of related work and demonstrate rigor, clarity, and originality. The ultimate aim is to produce work that could contribute meaningfully to the networking research community.

Some interesting conferences and workshops are:

- **Core networking:** SIGCOMM, NSDI, HotNets, IMC, CoNEXT, CCR, INFOCOM
- **Wireless:** MobiCom, MobiSys, HotMobile, SenSys, IPSN
- **Systems + Networking:** SOSP, OSDI, ASPLOS, USENIX ATC, HotOS, HotCloud
- **Security + Networking:** IEEE Symposium on Security and Privacy, CCS, USENIX Security, NDSS
- **Theory + Networking:** SIGMETRICS, PODC, SPAA, MobiHoc

2 Deliverables

The project has the following deliverables:

Deliverable Name	Weight	Due Date
Project Proposal	5%	Sep 23^{rd}, 2025 11:59 pm
Progress Report	3%	Oct 28^{th}, 2025 11:59 pm
Online project presentations	3%	Nov 17 19, 2025
Final Report	9%	Dec 2^{nd}, 2025 11:59 pm

Table 1: Research Project Deliverables

2.1 Project Proposal

For this phase, you are required to submit a two page research paper in a single-spaced, 12pt, one-column format. It should include a survey of the relevant literature, identification, and justification for the research project that will be undertaken, and a discussion of the expected contributions that might be made should the research project be successful. Providing a practical component, such as a simulation study or a prototype implementation/experimentation, is preferred.

The proposal should clearly define the research problem, starting with a summary followed by a brief paragraph explaining the problem's motivation and scope. The proposal should include a brief summary of related work and gap(s) in the existing literature, which motivates the problem. Next, describe the research

methodology, explaining how you plan to address the problem. You should also provide a timeline outlining your planned activities and demonstrating how the project can be completed within the term. Additionally, list any resources you will need to carry out your work.
Submission Instructions: The final PDF should be submitted through the LEARN dropbox.

2.2 Progress Report

The progress report should refine and reaffirm the research problem, including a brief explanation of its relevance and any updates since the proposal. The report must detail the progress made on the design, experimental setup, or implementation of systems or prototypes. If initial results or findings are available, these should be presented together with a preliminary analysis. The methodology section should clarify how the problem is addressed, such as through simulations, testbeds, or analytical models, and highlight any tools or frameworks used. The report should also candidly discuss any obstacles encountered and how you have adapted your approach. Finally, the report must include a roadmap for completing the project on time, outlining the remaining work, expected outcomes, and how you plan to stay on track.
Submission Instructions: The progress report should be 2-3 pages (including references) and prepared in LaTeX using the `acm-sigconf` template which can be found here: ACM SIG Proceedings Template. The final PDF should be submitted through the LEARN dropbox.

2.3 Presentation

In the presentation, you are expected to showcase your research project and provide a comprehensive walkthrough of your work, explaining the outcomes and achievements resulting from your efforts.

2.4 Final Report

The final deliverables for the project should resemble the structure and quality of a conference-style research paper. Your submission must include and will be graded based on the following components:

2.4.1 Technical Report

A comprehensive report (typically 6–8 pages) that clearly presents your research in a structured and professional format. The report should include:

1. **Title and Abstract:** A concise summary of your research question, methods, and key findings.
2. **Introduction:** Background context, motivation for the project, and a clear statement of the problem or research question.
3. **Related Work:** A brief review of existing literature or prior work relevant to your topic, highlighting how your work differs or builds upon them.
4. **Methodology:** A detailed explanation of the methods, tools, models, or algorithms used. This should be clear enough to allow reproducibility.
5. **Experiments and Results:** A description of your experimental setup, datasets (if applicable), evaluation metrics, and a thorough analysis of the results obtained.
6. **Discussion:** Interpretation of your results, limitations of your approach, and possible explanations for unexpected outcomes.
7. **Conclusion and Future Work:** A summary of what you achieved, key takeaways, and suggestions for future improvements or extensions of the work.
8. **References:** A properly formatted list of all cited works.

2.4.2 Reproducible Codebase:

- The full source code used in your project, organized and documented clearly.
- A README file with instructions on how to set up the environment, run the code, and reproduce the results presented in the report.
- Any scripts for data preprocessing, training, testing, or evaluation must be included.

Submission Instructions: The final report should be 6-8 pages and prepared in LaTeX using the `acm-sigconf` template which can be found here: ACM SIG Proceedings Template. The final PDF *and* LaTeX source as a `.zip` should be submitted through the LEARN dropbox.