# CS201 Course Project (Optional)

**2025 Spring Semester**
**Due: Jun. 23th, 2025, please submit through Blackboard**

## 1 Project Introduction

In this semester, you are suggested to work on topics related to *human bias in evaluation systems*. In particular, there have been many evaluation systems, e.g., review on movies, products, and APPs, peer review for research papers, review for driving sharing, etc. These reviews, scores, or rankings are provided human and hence can be biased. The following lists several examples:

- Reviews on online purchase platform, e.g., Taobao: We usually give five stars unless we are unhappy about the goods. [Biased review due to common behaviors.]
- Reviews on online food delivery: We do not usually provide reviews. We provide reviews only when we are angry about the delivery man or restaurant or when the restaurant offers us coupons. [Provide review only when we are biased.]
- Reviews for research papers: We are sometimes not familiar with the paper topic, so our score may not correctly reflect the quality of the paper. [Biased review due to limited knowledge.]
- Reviews for movies: We may tend to follow the feedback from the others. If the movie has a good reputation (e.g., recently a high score), we may tend to provide a high score. [Biased review due to peer effect.]
- ...

**What do you need to do in this project?** Find a specific topic in the area of human bias in evaluation systems, e.g., any of the above, and propose a method or algorithm to mitigate the human bias and make the evaluation system more robust and trustworthy. You are highly recommended to focus on a specific kind of bias (e.g., bias due to delayed feedback, knowledge limited, intentionally attack, etc.) in a specific area. If you consider a very general setting, the problem may become very complicated. You need to provide theoretical analysis, real-world experiments, or/and data analytical result to validate that your method is effective.

**Any example?** The following paper provides a good example: *Y. Lu, Y. Kong, "Calibrating 'Cheap Signals' in Peer Review without a Prior." in Proceedings of the Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023.* Your are also encourage to conduct you own literature review and find related papers.

## 2 Written Report

When you write your report, please regard it as writing an academic paper. That is, it should be a complete and coherence story, and the discussions should be formal and rigorous.

Here provides a suggestion on the report organization. However, since the aforementioned projects are quite diverse, the following suggested organization may not be applicable to some of the topics. You may modify it based on the topic you choose.

- Motivation and Introduction:
  - What is the problem you are going to solve or discuss?
  - Why this problem is important or exciting?
  - What is your idea for addressing this problem? Why is it a good idea?
- Review on existing works and approaches
  - Have other people considered the same problem? How did they address it?
- Problem Formulation:
  - Formulate or explain your problem using mathematical notations and statements
- Solution or Algorithm Design:
  - Describe your solution in details. The solution could be done using mathematical techniques or programming.
  - Explain how and why the solution can solve the problem.
- Result and Discussion:
  - Analyze the performance of your solution theoretically or empirically.
  - Discuss the insights obtained from the results.
- References: cite the papers you referred to

## 3 Important Notes

- You are assumed to work individually. If you refer to materials (e.g., papers, online resources), please indicate clearly the references in your report.
- **Deadline**: The project report is due on Jun. 23th, 2025 (Firm deadline, NO Extension).
- **How to submit**: Submit your project on Blackboard, including
  - Submit a written report: in PDF file; in English; using IEEE conference format[1]; double-column, no longer than 6 pages.
  - Supplementary materials (if necessary): demo, codes, etc.

[1]Visit `https://template-selector.ieee.org/secure/templateSelector/publicationType`, select *Conference*, then select *Original Research*. You can then choose either *Word* or *Latex* template.

- **Marking**: The project is optional and counts 5% additional overall marks. In particular, if you submit a report, you will get an additional score of

$$\text{Initial Score} \times \text{Difficulty Coefficient} \times 5\%$$

The initial score is 100 points in total. The tentative marking scheme is as follows. However, since the project covers various topics, this is only a rough scheme.

  - Motivation and research question (exiting and creative topic, reasonably and clearly motivated): 20 points
  - Review on existing works and approaches (rigorous and clear math description, review of a family of existing approaches if necessary): 20 points
  - Problem formulation (rigorous and clear math presentation, characterize important factors of the research question you are going to solve): 20 points
  - Solution (rigorous and clear math/programming presentation, whether the problem has been properly and completely solved, supplementary materials if necessary): 15 points
  - Discussion and conclusion (complete and interesting results, critical thinking): 15 points
  - IEEE conference format (format, whether the format looks good or not): 10 points

The difficulty coefficient:

  - Trivial (a homework question that can be solved within several hours): **-20%!!!** If you do not spend time on this project, you will definitely get a negative score. Thus, if you do not want to spend time, a better strategy is to simply give up this project.
  - Easy (you collected and learned many materials and organized the materials without your own understanding): **0%!!!**
  - Good (you provide a reasonable and complete analysis and discussion on the topic you choose; from the report, I can see your own understanding and innovative ideas): 50%
  - Hard (you provide a comprehensive discussion on the project and raise an interesting and novel question, which is relatively challenging to solve, and propose an innovative solution, or you bring out creative and exciting discussions): 80%
  - Expert (I am totally amazed by the result, and the report can be extended to an academic paper): 100%