EECS 6466 (Fall 2025): Project Description (30 marks)

This document describes the details of the class project's deliverables, as listed below:

1. Project proposal: DUE: **Oct 20, 11:59 pm** – 5 marks
2. Literature review (Written) DUE: **Nov 3, 11:59pm** - 5 marks
3. Project design and initial results (Presentation) DUE: **Nov 25, 1pm** – 10 marks
4. Final Report (Written) DUE: **Dec 14, 11:59 pm** - 10 marks

Introduction

- You will deliver a project in this course that is related to one of the main themes of the class: (a) AI for testing and reliability or (b) SE for AL.
- You choose the topic of the project yourself.
- The study can be at extension of the assignment as well.
- You can do the project alone, in a team of 2, or 3.
- If you go with a team delivery, all team members will get the same mark for the project assuming all did equal work.
- The instructor does NOT get involve in resolving potential conflicts, dropouts, or lack of equal contribution.
- It is up to you to decide if you want to go with a team. Also, up to you to find team members if you opt for it.
- The expectation is the same regardless of the team size!
- The teams cannot change after the proposal day!

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(1) Project Proposal:

Submit a written document (in PDF) to eClass, following IEEE conference template format.
Link to the manuscript templates in Word and Latex:
https://www.ieee.org/conferences_events/conferences/publishing/templates.html
The document should have ONE page of content no reference is necessary.

1- Introduction to (motivation of) the problem
2- Brief background and related work
    a. Relevant techniques and tools (discuss at least 3 relevant papers)
    b. How this study is different than the related work
3- Proposal (half a page)
    a. High-level objectives
    b. Novelty
    c. Dataset/cases
    d. Measurements
    e. Procedure

Marking criteria (5 marks).

- Feasibility and appropriateness of the proposal
- Minimal background and related work
- Method and plan

Rubric: Excellent (5); Very Good (4), Good (3), Average (2), Poor (1)

- **Notes:**
    - You are highly recommended to run the idea with the instructor and get his informal approval before writing the proposal
    - if the proposal is not approved (due to problems such as: not relevant to the course, too small, unrealistically large, already done, etc.), you lose marks and need to change the topic.
    - The proposal details can be refined, over time, as you learn more in class and by your own, but you have to keep your instructor in the loop for major changes.

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(2) Literature review:

You need to read two types of papers for literature review: Background and related work.

Background is about the techniques and problems. For example, if you are researching on the use of LLMs for detecting vulnerabilities in web applications. Both these topics alone are background. Background papers can be older. Can be book chapters. Might not be from SE.

Related work on the other hand are the closest papers to your topic. For example, in above example, a paper that uses LLMs for detecting vulnerabilities in C code is a related work. Related work can be very new and mostly are form the SE domain (main SE conferences and journals or sometime ML conferences).

Here is a list of main conferences and journals in SE and ML conferences that might help you find related work:

- SE Conferences:
  - ICSE
  - FSE
  - ASE
  - MSR
  - ISSTA
  - ICST
  - ICSME
- SE Journals:
  - TSE
  - TOSEM
  - EMSE
  - ASE
  - JSS
  - IST
- Some of the relevant ML conferences
  - Neurips
  - ICML
  - ICLR
  - AAAI
  - ACL
  - EMNLP

Notes:

- This list is not exhaustive!
- You can access the papers from digital library through YorkU library. Let me know if you don't know how.

Deliverable:

Submit a written document (in PDF) to eClass, following IEEE conference template format.
Link to the manuscript templates in Word and Latex:
https://www.ieee.org/conferences_events/conferences/publishing/templates.html
The document should have 3 pages of content + a page or two for the references.
You must at least talk about 30 papers in your document. For instance, 10 in the background Section and 20 in the related work. Or 15-15. (at least 15 should be in the related work)

You need to organize your report as follows:

1- Summary of the proposal (half a page)
2- Background (maximum 1 page)
    a. Organize it into sub-topics as needed.
3- Related work (up to 2 pages)
    a. Relevant techniques and tools
    b. How this study is different than the related work (0.5 page)
4- References following the IEEE conference style. see the above template.

Marking criteria (5 marks)

- Complete background
    - Breadth
    - Depth
    - Correctness
- Complete set of related work
    - Breadth
    - Depth
    - Correctness
- Writing
    - Precise, and concise
    - Correct grammar and easy to read
    - Correct formatting including for references

Rubric: Excellent (5); Very Good (4), Good (3), Average (2), Poor (1)

(3) Project design and initial results (presentation):

You have 20 minutes to present the followings:

- A brief reminder of your project's context (5 minutes)
  - Problem
  - Proposal
  - Related Work
  - If anything has changed since the proposal day
- Detailed design (10 minutes)
  - All details about the design of your study. For example, for a typical controlled experiment include:
    - Objectives
    - Research questions
    - Data sets and techniques (algorithms and models etc)
    - Subjects of the study
    - Evaluation metrics
    - Execution environment and other setup/configs
    - Procedure (per RQ if different)
    - Statistical analysis (if used)
- Results: Progress so far (5 minutes)
  - Some results are expected but not all. For example, you can show your results but not have a baseline. Or have some baselines ready but not yours fully. Or have some metrics ready for all but not all metrics.
  - If you are unsure whether your results are enough or not, email me to get confirmation but give yourself enough time to add extra if I tell you so.

Marking criteria (10 marks).

- Proper recap and related work (including potential requested changes)
- Correctness of the presented material (correct design)
- Correctness of the presented material (complete design and enough results delivered)
- Presentation and timing
- QA

Rubric: Excellent (10); Very Good (8), Good (6), Average (4), Poor (2)

Note: if you are absent you won't get the mark for the presentation

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(4) Final Report (Written):
Prepare a written document (in PDF) following IEEE conference template format (10 pages + max 2 pages for references). You can have up to 2 extra pages for appendices, if necessary.
Link to the manuscript templates in Word and Latex:
https://www.ieee.org/conferences_events/conferences/publishing/templates.html

You need to organize your report as follows:

5- Abstract (~0.5 pages)
6- Introduction (~1 page)
7- Background (~1 page)
    a. Organize it into sub-topics
8- Methodology (~1 page)
9- Experiment (~5 pages)
    a. Objectives and research questions
    b. Software under study's specification and statistics
    c. Evaluation measurements
    d. Procedure (up to 1 page)
    e. Results (~2 to 3 pages)
    f. Discussion on the results
    g. Threats to the validity of the study
10- Related work[1] (~1 page)
    a. Relevant techniques and tools
    b. How this study is different than the related work
11- Conclusion and future work (~0.5 pages)
    a. Summarize your project report
    b. Future directions
12- References (up to 2 pages)

Note: you can reuse the background and related work from the assignment.

Marking criteria: Report (10 marks).

- Completeness
- Correctness
- Writing
- Organization, and formatting

Rubric: Excellent (10); Very Good (8), Good (6), Average (4), Poor (2)

[1] Optionally you can mix Background and Related work sections together and have them as section 3. That is more useful if you must discuss related work before you can explain your method.