CS3244 Project Rubric

### Project Objectives and Tasks

The objective of your group project is to train and evaluate a machine learning model on a substantial dataset. You will

1. Read Project Quick Start Guide: <http://tiny.cc/cs3244-project-start>
2. Form a project sub-group and group.
   1. Sub-group formation and indicate dataset preference (**PT1**).
   2. Full group formation (**PT1b**)
3. Finalize choosing a dataset.
4. Propose your project plan (**PT2**).
5. Perform modeling
   1. Prepare your dataset for modeling.
   2. Train models.
   3. Evaluate models.
   4. Understand the models and results.
   5. Iterate on your data preparation or model training and tuning to improve performance.
6. Report your findings (**PT3**).

Note that for this course, it is more important to demonstrate that you understand the various tasks of modeling, and not just naively getting high accuracies.

You will get more points demonstrating a deep understanding of weaker models that you improved with good justification, rather than randomly trying models that appear to perform well.

### PT1. Sub-group formation

Due: W02 Sunday, 27 Aug 2023, at 23:59

Join a PG sub-group and indicate dataset preferences: <http://tiny.cc/cs3244-pg-sub-formation>

Please make sure to submit as a Canvas Assignment by the deadline.

### PT1b. Full group formation

Due: W03 Sunday, 3 Sep 2023

The teaching staff will match up sub-groups to form full PG groups and indicate on Canvas groups. You will be notified by end W03, and may request changes, though we may be unable to accommodate.

Each PG group will be advised by a PG mentor.

### PT2. Project Proposal (5%)

Due: W05 Sunday, 17 Sep 2023, at 23:59

Describe your project proposal with the details indicate at: <http://tiny.cc/cs3244-project-proposal>

Please make sure to submit as a Canvas Assignment by the deadline.

### PT3. Final Presentation (20%)

Due: W16, Sunday, 3 Dec 2023, at 23:59 (Exam Week 1)

You will submit a recorded **project presentation video (15 minutes max)** and any **supporting materials** as a zip archive, inclusive of:

* (if needed), README.pdf file narrating this file and other contents, which may include
  + Links to external demonstration sites, or app store links
  + Links to previous cited works or publications mentioned in the presentation video
* Zip archive or folder of source codes,
* Statement of the group’s independent work.

Name both files with your root filename after your group: **PG-##**.mp4 and **PG-##**.zip, where you replace **##** with your group number.

The following rubric describes how you will be graded as a group.

*Note that this will be moderated for each individual student based on your TEAMMATES peer review.*

#### Content (70% of total 20% marks)

* Originality (4%):
  + How many original elements are done in the project?
  + It’s not necessary that no other team has done your tasks before, but it needs to reflect your ability to think analytically.
* Relevance (4%):
  + How strongly connected is the project to this course?
  + Do you use core concepts of ML mentioned in the class?
* Related Work (4%):
  + Do you present a sufficient and extensive study of related work to the task? Formal academic references, useful web articles and posts material, and other related work should be considered in this aspect. Remember to cite explicitly.
  + Do you articulate how your work is novel when compared to prior work?
* Technical Justification (10%):
  + Is your technical approach suitable to try to solve your proposed problem?
  + Is your technical approach valid for your prediction task and dataset?
  + Are there technical flaws in the execution of the approach?
  + Are evaluations performed with the appropriate metrics and correctly interpreted?
* Implementation (20%):
  + Did you implement multiple models (baseline, and best)?
  + Did you implement the models correctly?
  + Did you tune them?
* Model Evaluation (18%):
  + Do you address both macroscopic, dataset-wide level performance (e.g., RMSE, Accuracy, F1 measures) as well as microscopic, individual instance level performance (careful error analysis with diagnosis)?
  + Do you demonstrate improvement in performance from one model to another?   
    A baseline model may be an implementation of a simpler model or version of your model, or referenced from other literature (make sure to give appropriate citations).
  + Note that your performance need not be very high (e.g., 90%) if your data problem is hard. But you should show improvement over some baseline approach. This includes conscientious efforts to improve performance.
* Results Interpretation (10%):
  + Error analysis: Explain, with evidence, why the model may be performing poorly (or not as good as you wish).
  + Do you justify technically why your model is good or has improved? I.e., rationalize your approach’s performance effectiveness.
  + Future improvements: Discuss how you may further improve your model.
  + You do not have to implement or test all your ideas, if too infeasible. Though discussing them helps to show your grading staff that you have good and valid ideas.

#### Presentation (30% of total 20% marks)

* Quality / Organization (10%):
  + Time Control - Whether you complete an efficient presentation within the specific time frame. Do you allocate a reasonable balance of time within the presentation time limit to cover each component as comprehensively as possible?
  + Production Quality: How good is the production value of your video? How well is your presentation structured?
  + Are both audio and visuals well-connected?
  + Are both channels of communication used to communicate effectively?
* Clarity / Understanding (10%):
  + Is the motivation for your task clear, plausible and rational?
  + Is the problem statement well-defined using machine learning terminology?
  + Is the technical approach described clearly and detailed enough for your peer learners to understand and replicate?
  + Is it sufficiently well-organized to omit less relevant information that should be common knowledge to fellow classmates? Do you relegate less important information to supplemental materials?
  + Is the evaluation method described clearly and detailed enough for a peer to replicate? Are the evaluation results described and interpreted clearly?
  + Do not just report numbers, but illustrate (with figures, tables), and explain them. Do not assume that your audience knows what your numbers mean.
* Visual Component (6%):
  + Are the slides or presentation materials error-free and do they logically present the main components of the topic?
  + Are the materials neat, colorful or visually creative?
  + Are the materials readable? Do the graphics highlight and support the main ideas?
  + Do you use the most appropriate presentation means — slides, video, demonstration, or other audio/video vehicle — to convey your component’s message most compellingly?
* Oral Component (4%):
  + Are the speakers audible and fluent on their topic? Is the audio narration articulated well (No mumbling, with few pauses and verbal fillers — “um”, “uh”, “er”)
  + Is the text summarized and not read directly?
  + Do the speaker(s) speak with enthusiasm, poise and assurance?