

**Generative AI**  
**Project A**  
**Dr Muhammad Atif Tahir (Spring 2024)**

Due Dates: 15<sup>th</sup> Feb 2024, 27<sup>th</sup> Feb 2024, 19<sup>th</sup> March 2024, 2<sup>nd</sup> April 2024 and 9<sup>th</sup> April 2024

Total Marks: 10

Group of 3 already shared through Google Sheet. Group members are picked randomly by the instructor to encourage diversity. I have also assigned group leader and he / she is responsible to submit report and provide evidence of team work. You cannot change your group members. Every group member should write his substantial contributions in the report.

Consider the following Pascal Challenge on Classification. Use only train / val data. Thus, train will become training and val will become testing data.

<http://host.robots.ox.ac.uk/pascal/VOC/voc2008/index.html>

- (a) Understand the problem, data, evaluation function and show it in the report [1 Point]  
(Due Date: 15<sup>th</sup> Feb 2023; Evaluation during Lab)
- (b) Apply VGGNet through transfer learning on classification challenge and compare the results. Discuss in your words including showing top 10 ranked photos through each architecture. Explain Mean Average Precision which is main evaluation criterion through examples (Due Date: 27<sup>th</sup> Feb 2024; Evaluation during Lab). Write all into report [3 Points]
- (c) Use Variational AutoEncoder to generate random data of each class but using training samples only. Then repeat part (b) using new augmented data. Plot curves report for 100, 200, and 500 samples / class generation. Discuss why and why not there is no improvement in your own words [Due Date: 19<sup>th</sup> March 2024] [2.5 Points]
- (d) Use GAN to generate random data of each class but using training samples only. Then repeat part (b) using new augmented data. Plot curves report for 100, 200, and 500 samples / class generation. Discuss why and why not there is no improvement in your own words [Due Date: 2<sup>nd</sup> April 2024] [2.5 Points]
- (e) Overall Combined Report. Max Page = 6 including references [Due Date: 9<sup>th</sup> April 2024] [1 Point]

## **Marking Criteria**

Since the elements above are wide ranging, general criteria are given that are applied as a percentage to each component of the portfolio. In the following, 'writing' is understood to apply both to coding and English.

(0 - 49%) A very poor contribution showing little awareness of subject area. Lack of clarity. Communication of knowledge is either inarticulate and or irrelevant. Code fragments from the Internet may have replaced student written content to the extent that it is not possible to determine what the student has understood. Only partial functionality has been achieved.

(50 - 64%) Knowledge is limited or superficial. Some awareness of concepts and critical appreciation are apparent, but there are major omissions or misunderstandings. Writing is not clear and there is no argument. Incorrect solutions or non-functioning software solutions have been given.

(64 - 79%) Knowledge base is up-to-date and relevant to an appropriate breadth and depth as final year students. The student has demonstrated the ability to apply theory and concepts, across domains and identify their interrelationship. A critical appreciation is demonstrated, which is supported by appropriate references. Writing is clear if little uneven. Source code is functional, structured and commented. Code is valid and mostly secure.

(80 - 100%) As above but there is clear evidence of independent thought and reasoned conclusions. Literature is fully supported by citation using appropriate references and there is development of a critical appreciation of opposing arguments. Presentation of work is fluent, focused and accurate. Source code is clear and properly commented. Clearly exceeds taught material.