

# CSCI316 Big Data Mining Techniques – Winter 2024

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# Project 2: Deep Learning Pre-trained Modeling (Transfer Learning) – Inception Models

1. The project is for a group of at least 4 accounts for 15% of your mark.
2. Deadline is the End of week 10.
3. You need to submit a detail report of your design and implementation choices and interpretation of the output along with the project code.
4. Each project has several steps, for some steps you may not use any ML library and they need to be implemented using Python.

# Project 2

**Objective**

The purpose of this project is to introduce to you the concept of Transfer Learning. You can go through this blog for some inspiration : <https://towardsdatascience.com/car-classification-using-inception-v3-71b63e9825b7>

You are required to consider exclusively Inception Models for image classification. Your tasks should be about deriving intelligence from images. Pick a category of images dataset of your choice and answer a question on the basis of their contents (Make sure you clearly define the question first). You may lean on any of the following suggestions:

1. Medical or diagnosis classification. You consider a medical dataset made of images and you derive some intelligence from the set. It could be a disease, the severity of symptoms for a particular disease…
2. Objects detection. Given an image set, derive a list of possible objects identifiable on the image and map the identities to some text or description
3. Facial recognition. You can mimick smart gates application from Airport or Police security systems.
4. Etc…

**Task requirements**

1. Define your task, justify the choice of such a task for a “Transfer Learning” Assignment
2. Define how Transfer Learning is appropriate for your task
3. Do and document all necessary pre-processing
4. Demonstrate the different steps of model building (pre-training, parametrization, training, testing and deployment). Please defend your choice of Target values
5. Provide the same versions in both TensorFlow and Keras.
6. Test all the models using appropriate metrics of your choice.
7. Write a report and explain your findings.

**Deliverables**

• A Python script named <your\_studentID>.ipynb that includes all of the above implementations. The code must be correct and accompanied with informative comments.

• A report that clearly explains the methods and design decisions of your implementations. You report should include the accuracy of the output of each step and your interpretation of the output.