CSY3025 Artificial Intelligence Techniques - Assignment 2

**Topic: Scan your face to register attendance**

Submission deadline: 18th June 2023

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**Introduction**

Attendance registration is an important tool for universities to improve student engagement and performance. However, existing attendance tracking solutions have their limitations.

Your task is to design and implement a deep-learning image classifier that can recognise students in the classroom from close-up facial images to register their attendance.

The classifier should have the capability of handling at least 5 (five) different people including yourself with a reasonable performance. Acquire other students’ permission if you wish to use photos of them for machine learning or testing. Other students’ identities should be anonymised. You should discuss your choice of performance metrics according to the application scenario. You are responsible to develop the image dataset for machine learning and testing. You must also critically analyse any bias and ethical challenges related to your dataset and model design. To achieve a higher grade, you are expected to design and implement additional features.

Examples of additional features are (but are not limited to):

* Handling more people (>5)
* Handling multiple people in the same shot.
* Inclusion of different demographic groups,
* An exceptional performance demonstrated through “in-the-wild” testing
* implementations of user interfaces/user applications

To complete the task, you must study the problem space, establish a dataset, design and train a deep learning single-label multi-class classifier, and use appropriate methods to evaluate the performance of your classifier.

**Deliverables**

The deliverables of the assignment are:

* Source code of a working deep learning model implemented using Keras/TensorFlow and Python. Source code of user applications, if applicable.
* A report that includes but is not limited to the following sections:
  + Cover page
    - A link to your dataset (e.g., github, figshare)
  + Introduction
  + Problem analysis and background research
  + Building deep learning network (explain how you make choices at each following step)
    - Dataset
    - DL Network (structure, loss function, optimiser, etc.)
    - Training and evaluation
  + Testing
  + Summary of additional features (if applies)
  + Discussions and conclusions
  + References
  + A copy of the source code in Appendix
* A 5-minute demo video about your design/implementation

There will be three submission points:

* Report
* Source code
* Demo video

