**COMP4423 – Assignment 2**

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1. **Task Requirement**

The assignment involves a hybrid task because it requires understanding the campus's unique architectural elements and context and discerning subtle differences in the visual style introduced by the AI-generated images.

1. **Understanding of PolyU Campus Architecture**: To accurately distinguish real images from fake ones, the algorithm needs to be trained on the architectural elements specific to the PolyU campus. For instance, it is easy to identify the Innovation Tower.
2. **Visual Style Recognition**: Additionally, the algorithm must recognize the visual style or signature introduced by the AI-generated images. Each visual style has varied color patterns, edge sharpness, etc.

The hybrid nature of the task arises from the need to combine these two distinct aspects:

1. **Object Detection**: The algorithm needs to accurately detect and classify objects and architectural elements present in real images of the PolyU campus.
2. **Classification**: Simultaneously, the algorithm must be trained to recognize the visual style characteristics introduced by the AI-generated images.

By combining object detection and classification with style recognition, the algorithm can effectively differentiate between real-world images of the PolyU campus and AI-generated images constructed in a specific visual style.

1. **Data Collection and Labeling**

It is assigned that data collection shall be performed manually. During collection, a total of 174 real images were collected. These images are taken in various venues, such as the platform lawn, the Innovation Tower, and the Z core platform. ALL real images are considered photorealism and used for training classification models. In addition, the AI-generated pictures are created with getimg.ai [1]. The AI tool provides three art styles: photorealism, artistic, and anime. There are 33, 33, and 28 fake images for each corresponding style.

1. **Image Preprocessing**
2. **References**

[1] Webrockets, 2024. *getimg.ai* (Version 1.0) [Image Generator]. [Online]. Available: https://getimg.ai/features/image-to-image

**1. Introduction**

This is a template for the COMP4423 Assignment 2 report.

Your report should be coherent with the code and the result, otherwise, you will lose marks.

**2. Method**

In your report, these questions should be answered:

1. In order to implement this system, what CV task do you think of it as?
2. What algorithms and models do you use?
3. How do you train and test the model?
4. How do you design to ensure the robustness of the model in a real scenario (color and scale variations)?
5. What problems do you find and how do you solve them?

**3. Structure of your report**

There should be a section to discuss the above questions. Except for this, there is no requirement for the report.