Module 1

Introduction to Computer Vision

▼ When did computer vision begin?

In the 1950s, with the invention of the “Perceptron” machine that used a very early “artificial neural network” that had the ability to sort images into simple categories such as triangles and squares

▼ What were the first commercial CV applications able to do in the 1970s?

- use optical character recognition (OCR) to interpret written text for the blind
- examples of OCR include reading handwritten postal codes on letters and numbers on license plates

▼ How did CV advance in the late 1990s?

the Internet began housing large sets of images that could be used for analysis, leading to the development of facial recognition programs

▼ What is OpenCV (Open Source Computer Vision Library)?

an open source computer vision and machine learning software library

▼ What is OpenCV **imread()?**

This is the function for reading an image. OpenCV imread() supports various image formats like PNG, JPEG, JPG, TIFF, etc.

▼ What is OpenCV **imshow()?**

This is the function for showing an image in a window. The window automatically fits to the image size. OpenCV imshow() supports various image formats like PNG,

JPEG, JPG, TIFF, etc.

▼ What is OpenCV **imwrite()?**

This is the function for writing an image. OpenCV imwrite() supports various image formats like PNG, JPEG, JPG, TIFF, etc.

▼ OpenCV example

- The following Python code reads in the image, writes it to a new image file (*sunflower_copy.png*) and then displays the image in a window in OpenCV.

```
import cv2
img = cv2.imread('sunflower.jpg')
cv2.imwrite('sunflower_copy.png', img)
cv2.imshow('sunflower_window', img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

- First, use the **import cv2** statement to import the OpenCV package. This will make available all OpenCV functions for use in our Python application.
- Next, for reading the image, use the **imread()** function.
- You can write the same image into another format, such as *.png*, by using the **imwrite()** function.
- For showing the image, use the **imshow()** function. You must give the window, to display the image in, a name. You can name it anything you want, for example, *sunflower_window*.
- Use **waitKey(0)** to display the window indefinitely until any keypress.
- Lastly, the function **destroyAllWindows** destroys all of the opened windows.
- Running the above code produces the following image output as well as saves a copy of the input image as a .png in the current working directory.