BINUS UNIVERSITY INTERNATIONAL

Final Project: "The Impact of Gaming Duration on Academic Performance and Class Engagement among BINUS FX Students"

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Course Code : COMP6065001   **Course Name** : Artificial Intelligence

Class   : L5AC   **Lecturer**   : Zhandos Yessenbayev, B.Sc., M.Sc., Ph.D.

Type of Assignments: Final Project

Due Date   : 17 December 2023

The assignment should meet the below requirements.

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Signature of Student:

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A. Problem description

The project of developing a machine learning snake picture identification involves various hurdles. One of the major issues is assembling a big and diverse library of taxonomically meaningful snake photos. The dataset should emphasize scale patterns because the color of the snakes is problematic for identification. However, gathering such a dataset is time-consuming and necessitates access to a wide range of snake species. Furthermore, the high intra-class variance and low inter-class variation in snake photos make it difficult for machine learning algorithms to effectively identify the images.

The creation of a feature extraction algorithm capable of effectively representing the specific properties of snake photos is a big problem. The approach adopted should be capable of capturing the intricate patterns and textures of snake scales, which can be challenging to depict. Choosing the best machine learning model to categorize the snake images is also a difficulty. The model should be able to handle the distinct aspects of the snake photos as well as the complicated interactions between the components. The chosen model should also be able to handle the imbalanced dataset, as snake photos from some species may be underrepresented. Finally, creating a user-friendly interface for the snake image identifier is a difficulty. The interface should be simple and straightforward, allowing users to rapidly and accurately identify snake species.

B. Solution features, e.g. algorithms used, special technologies used, user interface, etc.

- Algorithms used

- User interface

Our GUI categorizes an uploaded photograph of a snake into one of ten species using a pre-trained deep learning model. The software makes use of the Streamlit library for the user interface and the Keras library for loading the pre-trained model. The software defines a function named "processed_img" that accepts an image path as input, processes the image, and returns the anticipated snake species. The software also defines a "run" function, which generates the user interface and handles image submission and classification.

The "processed_img" function loads the image using Keras's "load_img" function and resizes it to (224, 224, 3). It then normalizes the pixel values and expands the dimensions to match the pre-trained model's input shape. The pre-trained model is utilized to estimate the class probabilities, and the predicted class is computed using the "argmax" function. Using a dictionary, the anticipated

class is then mapped to the correct snake species. Finally, the function outputs the projected snake species.

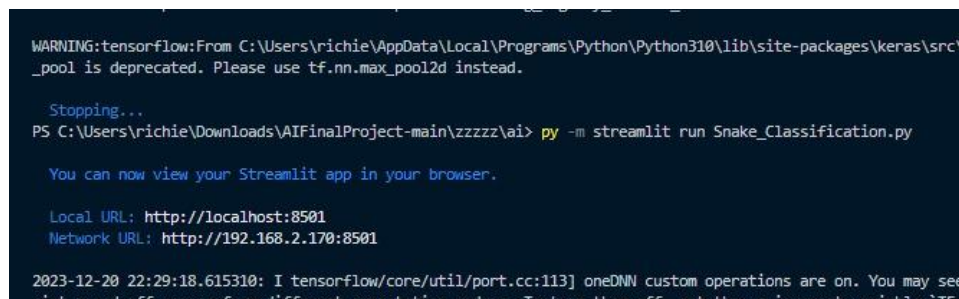## C. Solution design architecture

D. Experiments or tests that you have done.

There might be lots of animals that we can make as our project but we need to choose one animal. That conclusion was down to choosing snakes as our dataset and identifying the snake images for our project. We have experiments using some models to train them with the snake dataset but it comes down to using vgg16 or CNN. There are some trial and error where the training process is too long or being cut down when running on kaggle's notebook because it will stop automatically if there is no activity for 12 hours.

After the process of training the model is done, we then save the trained model and try to apply it on the GUI code so the user can use the application. There's not that going on in this part because we need to use the trained model and apply it to the application. Some obstacles that we face is when sizing the images because you don't know what size of the images that the user might upload to the application.

E. Program manual (with screenshots)
   a. Download files from this link:
      https://github.com/LeonardoRichie/AIFinalProject/tree/main/ai
   b. Run the python file first.
   c. Open terminal and write this command.


```
WARNING:tensorflow:From C:\Users\richie\AppData\Local\Programs\Python\Python310\lib\site-packages\keras\src\
_pool is deprecated. Please use tf.nn.max_pool2d instead.

  Stopping...
PS C:\Users\richie\Downloads\AIFinalProject-main\zzzzz\ai> py -m streamlit run Snake_Classification.py

  You can now view your Streamlit app in your browser.

  Local URL: http://localhost:8501
  Network URL: http://192.168.2.170:8501

2023-12-20 22:29:18.615310: I tensorflow/core/util/port.cc:113] oneDNN custom operations are on. You may see
```
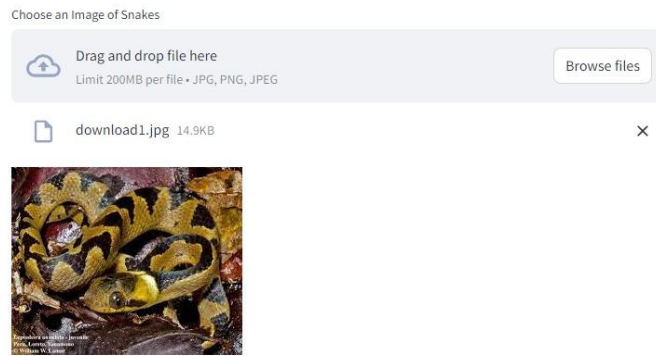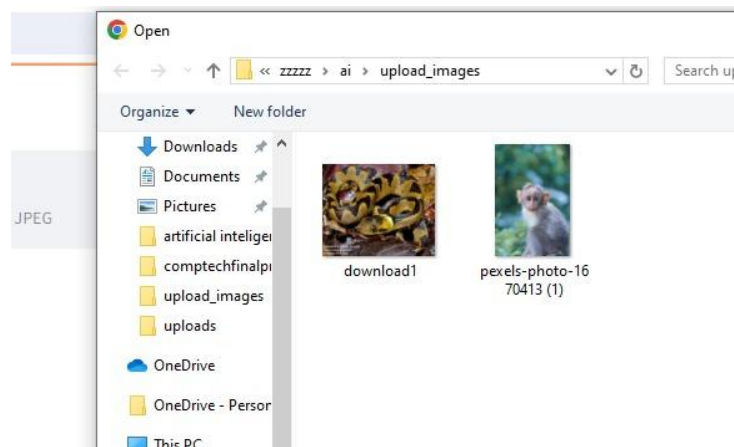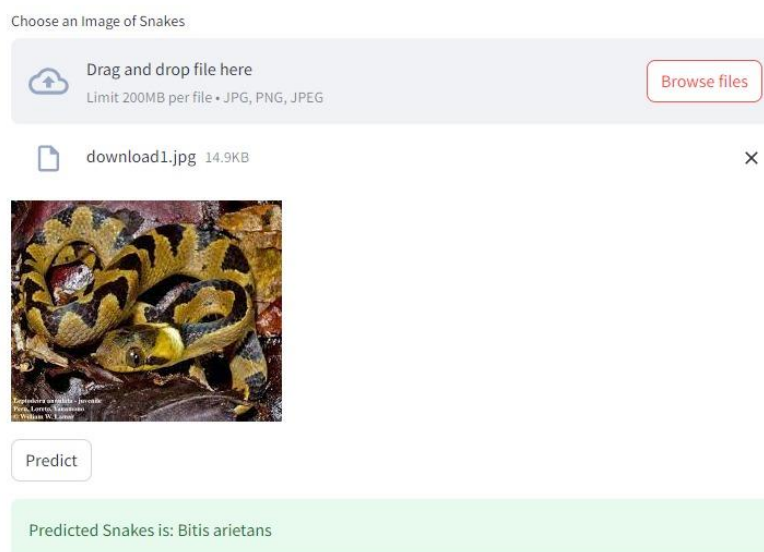
   d. It will show this UI after running it.

e. Make a folder called "upload_images" and put the picture you want to test.

f. Then click on the predict button and it will show results.

F. Link to video of the application demo (with max. length of 2 minutes)

Here is to our video demo:
https://drive.google.com/drive/folders/1dMTqllHhp2JmkKBdA62l1Y4JQRfTsRrd?usp=drive_link

G. Link to your GIT repository

This is the link to our project github repository:
https://github.com/LeonardoRichie/AIFinalProject