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RECOGNIZING FAMOUS PEOPLE IN VIETNAM

ABSTRACT:

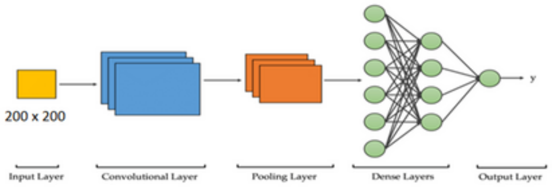
Nowadays, identifying a person's identity is extremely important for problems of information falsification, fraud, and appropriation of other people's property. Therefore, I research and design a model to identify some famous people in Vietnam, use Convolutional Neural Network (CNN) model, and analyze image data to make predictions.

1.INTRODUCTION:

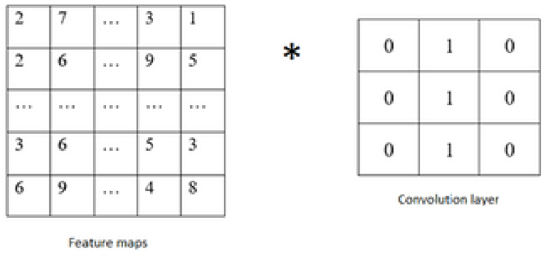
Identity identification is a topic of great interest today. Along with the great development of artificial intelligence, which supports many current smart devices, machines, etc., it is possible to verify a person's identity by image.
Prepare image data from the internet of 10 famous people in Vietnam, then process the image data and train the Convolutional Neural Network (CNN) model to be able to recognize and make predictions.
Build a graphical user interface (GUI) using Tkinter to communicate with the user and make predictions about the input image.

2.METHODOLOGY:

Using methods learned in Artificial Intelligence, I created a deep-learning model to solve the problem. Perform image processing and resize the input image to 200 x 200 pixels before training. The model uses a convolution I created myself and then combined with Artificial Neural Networks (ANN). Then evaluate and check the accuracy of the model.
The CNN model includes the input layer (200x200), convolution layer 1, pooling layer 1, convolution layer 2, pooling layer 2, convolution layer 3, pooling layer 3, fully connected layer, and Softmax regression classification layer (10 outputs).



The convolutional layer is the feature extraction layer by filtering all input data. First, the convolution kernel value (3x3 matrix) is transformed from left to right, top to bottom. Multiply the convolution matrix with each position to get the feature matrix of the image.

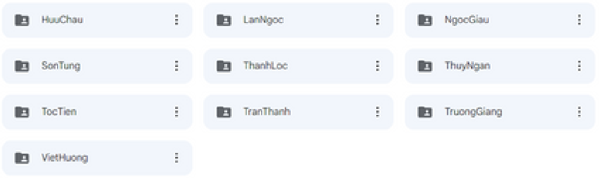


$$\begin{array}{|c|c|c|c|c|}\hline 2 & 7 & \cdots & 3 & 1 \\ \hline 2 & 6 & \cdots & 9 & 5 \\ \hline \cdots & \cdots & \cdots & \cdots & \cdots \\ \hline 3 & 6 & \cdots & 5 & 3 \\ \hline 6 & 9 & \cdots & 4 & 8 \\ \hline \end{array} * \begin{array}{|c|c|c|}\hline 0 & 1 & 0 \\ \hline 0 & 1 & 0 \\ \hline 0 & 1 & 0 \\ \hline \end{array}$$

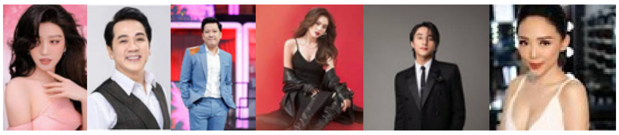
3.IMPLEMENTATION:

3.1.Datasets

The data used to train the model is the image data of 10 famous people in Vietnam, including 2404 images, I divided the initial dataset into 2 parts, the training part consists of 1764 images and the test includes 640 images for 10 outputs. Connect to the Drive to access the path to save the image data used for training and testing.



HuuChau
LanNgoc
NgocGiau
SonTung
ThanhLoc
ThuyNgan
TocTien
TranThanh
TruongGiang
VietHuong



3.2.Data Preprocessing

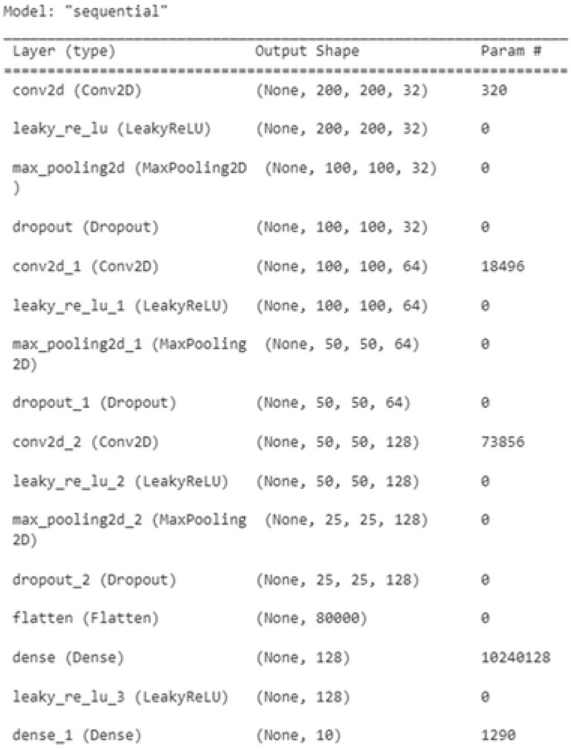
First, use the OpenCV library to process the image, and resize the original image to 200x200 pixels. Then create a function that handles the training data as well as the test data, creating labels for both of the above data. Then use the pickle module used to save these values to a folder on Drive.

3.3.Create CNN Model

The operation of constructing the experimental model is as follows:

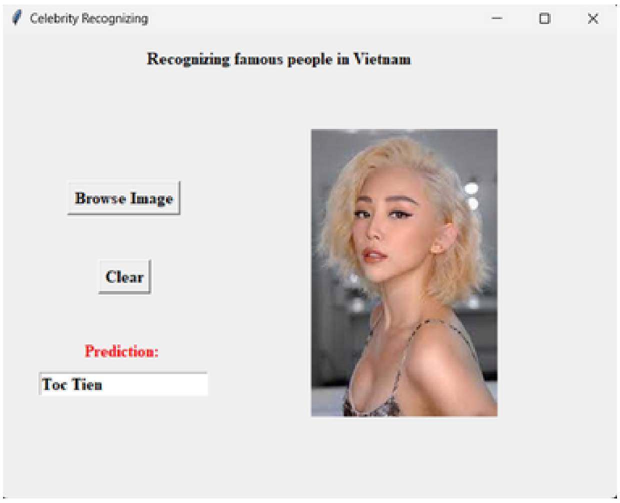
- Set up a keras Sequential model to facilitate the addition of data in an artificial neural network.
- Create a convolution layer with an image size of 200x200 and a number of filters of 32, the size of each filter is 3x3

- The 1st pooling layer is created, the first sampling is done with 32 images with the size reduced to half.
- · Convolution layer 2 is performed with a filter of 64, converting the original 32 images into 64 images.
- Create a 2nd pooling layer, perform 2nd sampling, continue to halve the 1st pooling layer
- The 3rd convolution layer is created with 128 filters, converting from 64 images to 128 images.
- · The 3rd pool is created to perform the final sampling thereby halving the size of the 2nd pool.
- Create a flat layer to convert the 3rd layer into a one-dimensional vector
- Create a hidden layer, choose the ReLu function as the activation function.
- · Set the output layer and use the Softmax function for the activation function to convert and predict.



```
Model: "sequential"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
=================================================================
 conv2d (Conv2D)             (None, 200, 200, 32)      320

 leaky_re_lu (LeakyReLU)     (None, 200, 200, 32)      0

 max_pooling2d (MaxPooling2D  (None, 100, 100, 32)     0
 )

 dropout (Dropout)           (None, 100, 100, 32)      0

 conv2d_1 (Conv2D)           (None, 100, 100, 64)      18496

 leaky_re_lu_1 (LeakyReLU)   (None, 100, 100, 64)      0

 max_pooling2d_1 (MaxPooling  (None, 50, 50, 64)       0
 2D)

 dropout_1 (Dropout)         (None, 50, 50, 64)        0

 conv2d_2 (Conv2D)           (None, 50, 50, 128)       73856

 leaky_re_lu_2 (LeakyReLU)   (None, 50, 50, 128)       0

 max_pooling2d_2 (MaxPooling  (None, 25, 25, 128)      0
 2D)

 dropout_2 (Dropout)         (None, 25, 25, 128)       0

 flatten (Flatten)           (None, 80000)             0

 dense (Dense)               (None, 128)               10240128

 leaky_re_lu_3 (LeakyReLU)   (None, 128)               0

 dense_1 (Dense)             (None, 10)                1290
```

3.4. GUI



Recognizing famous people in Vietnam

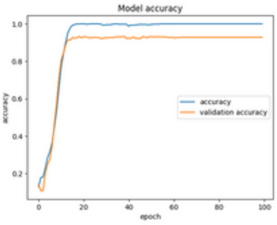
Prediction:

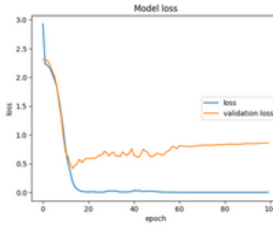
Toc Tien

4.RESULT:

- The training model has an accuracy of ~93%.
- Build user interface models.
- Identify some famous people.

By testing the model many times, I found that adding more image data to the training set will give better accuracy, but not true with high number of hidden layers, the accuracy will be high. Besides, the training model is relatively stable.





5.CONCLUSION:

Because the image recognition model is also a rather complex model, although it has quite a high accuracy, the model still has many limitations such as the data is quite small, so it is difficult to identify. exactly as it looks in reality. Future experiments and research are needed to correct errors and develop good things.

REFERENCE

https://iopscience.iop.org/article/10.1088/1742-6596/1395/1/012006/meta
Google Scholar

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