National
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Configuration Manual

MSc Research Project
Data Analytics

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Configuration Manual

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1 Hardware and Software Requirements

This configuration manual discusses the hardware and the software required to implement the research work. The steps taken are mentioned so it will be easy for anyone replicating the experiments.

2 System Specification

2.1 Hardware Requirements

The system specification of the system in which all the experiments are implemented are discussed below:

- **Processor:** Intel Core i7.

- **System Memory:** 1TB Hard disk, 256GB SSD.

- **RAM:** 16GB.

2.2 Software Requirements

The software required to implement the experiments are discussed below:

- **Windows Edition:** Windows 10 Enterprise.

- **Integrated Development Environment:** Google Colab Pro. The screenshot 2.2 attached below if of Google Colab.
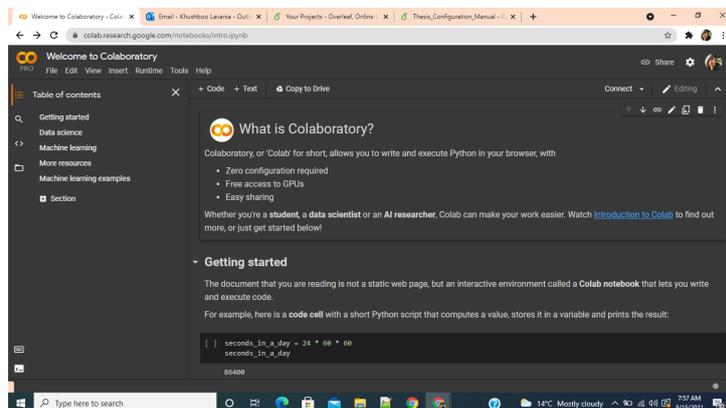
- **Scripting Language:** Python 3.
- **Cloud Storage:** Google Drive.
- **Libraries:** TensorFlow, Keras, Matplotlib, Numpy, OpenCV.

3 Experiment 1: GBRAS-Net-based CNN

1. Upload the dataset BOSSBase 1.01 onto Google Drive.

2. Open Google Colab Pro.

3. Follow the below steps on Google Colab Pro:
   - Go to File and then Open Notebook.
   - Upload the file by the name Resize_Image_Code.ipynb onto Google Colab Pro.

4. Go to Runtime and then Change Runtime type to GPU.

5. Execute all the steps till Mounting the Google Drive.

6. After mounting the Google Colab Pro-environment with the Google Drive, change the input_path variable and storage_path variable. The input_path variable contains the address from the google drive path where the dataset BOSSBase 1.01 is uploaded. The storage_path variable should contain the address from Google Drive where you want to store the resized images. The variable that has to be changed can be referred from the below code snippet.

```
#Path of the images
input_path="/content/drive/My Drive/Dataset_Large/Stego/"

#Path of the resized images
storage_path="/content/drive/My Drive/Dataset_Large/Resized_Image/Stego/"
```

7. Execute all the remaining blocks of code.

8. Again follows the below steps on Google Colab Pro:
   - Go to File and then Open Notebook.
   - Upload the file by the name State_of_Art_Experiment1.ipynb onto Google Drive.

9. Go to Runtime and then Change Runtime type to GPU.

10. Execute all the steps till Mounting the Google Drive.

11. After mounting the Google Colab Pro environment with the Google Drive, change the log_path,img_path,input_path_cover, and input_path_stego variable. The log_path and img_path contain the path where you want to store logs and images respectively. The input_path_cover and input_path_stego variable should contain the path where the image resized after completing steps till 7 are stored. The variable that has to be changed can be referred from the above code snippet.

```
#Defining the required path
log_path = "/content/drive/My Drive/Research/logs"
img_path = "/content/drive/My Drive/Research/images"
input_path_cover = '/content/drive/My Drive/Dataset_Large/Resized_Image'
input_path_stego = '/content/drive/My Drive/Dataset_Large/Resized_Image'
```

12. Execute all the steps till Training and Evaluating Model's Performance.

13. In the step Saving the Best Performance model, change the path where you would like to store the best performing model.

14. In the step Loading and Evaluating the Performance of the best performing model, change the path to the path where you have stored the best performing model in Step 13.

15. Execute the remaining steps.

4 Experiment 2: GBRAS-Net based CNN on ALASKA2 Datase

1. Upload the dataset DATASET_ALASKA onto Google Drive.

2. Open Google Colab Pro.

3. Follow the below steps on Google Colab Pro:

   - Go to File and then Open Notebook.
   - Upload the file by the name Resize_Image_Code.ipynb onto Google Colab Pro.

4. Go to Runtime and then Change Runtime type to GPU.

5. Execute all the steps till Mounting the Google Drive.

6. After mounting the Google Colab Pro-environment with the Google Drive, change the input_path variable and storage_path variable. The input_path variable contains the address from the google drive path where the dataset DATASET_ALASKA is uploaded. The storage_path variable should contain the address from Google Drive where you want to store the resized images. The variable that has to be changed can be referred from the below code snippet. This step has to be followed separately for all the folders inside the dataset.

```
#Path of the images
input_path="/content/drive/My Drive/Dataset_Large/Stego/"

#Path of the resized images
storage_path="/content/drive/My Drive/Dataset_Large/Resized_Image/Stego/"
```

7. Execute all the remaining blocks of code.

8. Again follows the below steps on Google Colab Pro:

   - Go to File and then Open Notebook.

- Upload the file by the name GBRAS_Net_ALASKA2_Experiment2.ipynb onto Google Drive.

9. Go to Runtime and then Change Runtime type to GPU.

10. Execute all the steps till Mounting the Google Drive.

11. After mounting the Google Colab Pro environment with the Google Drive, change the log_path,img_path,input_path_cover, and input_path_stego variable. The log_path and img_path contain the path where you want to store logs and images respectively. The input_path_cover and input_path_stego variable should contain the path where the image resized after completing steps till 7 are stored. The variable that has to be changed can be referred from the below code snippet.

```
#Defining the required path
log_path = "/content/drive/My Drive/Research/logs"
img_path = "/content/drive/My Drive/Research/images"
input_path_cover = '/content/drive/My Drive/Dataset_Large/Resized_Image'
input_path_stego = '/content/drive/My Drive/Dataset_Large/Resized_Image'
```

12. Execute all the steps till Training and Evaluating Model's Performance.

13. In the step Saving the Best Performance model, change the path where you would like to store the best performing model.

14. In the step Loading and Evaluating the Performance of the best performing model, change the path to the path where you have stored the best performing model in Step 13.

15. Execute the remaining steps.

5 Transfer Learning-based Inception V3 and Efficient-Net B3

1. Upload the dataset ALASKA2_Large Replica onto Google Drive.

2. Open Google Colab Pro.

3. Follow the below steps on Google Colab Pro:

   - Go to File and then Open Notebook.
   - Upload the file by the name InceptionEfficientNet.ipynb onto Google Drive.

4. Go to Runtime and then Change Runtime type to GPU.

5. Execute all the steps till Mounting the Google Drive.

6. Change the input_path variable with the path of the google drive where the dataset ALASKA2_Large Replica is uploaded.

```
#Defining the path of the dataset
input_path = "/content/drive/My Drive/ALASKA2_Large Replica/"
```

7. Execute the remaining steps.