Twitter Bot Detection – Help Page

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Important Note-

The main folder contains the following sub-folders:

- **Data:**
  bots_tweets.txt, human_tweets.txt – These files are the tweets dataset used for training.
  glove.twitter.27B.200d.txt, wiki-news-300d-1M.vec – These files contains the word embedding vectors.
  COVID.csv – This file contains unsupervised tweets about covid-19 for bot detection testing.
  In the first using, this folder is empty, please download all these files in the following link: Dataset Files Link

- **Output:**
  This folder contains all the results generated by our software.
  For example, all models that have been created from the configuration window, and all the excel results that we produced from predicting phase.
  This folder already contains the default models that are already trained and ready for use.
  In the first using, this folder is empty, please download all these files in the following link: Output Models Link

Note: all models must be saved on the 'output' folder, otherwise you cannot see them in models list on predicting phase.
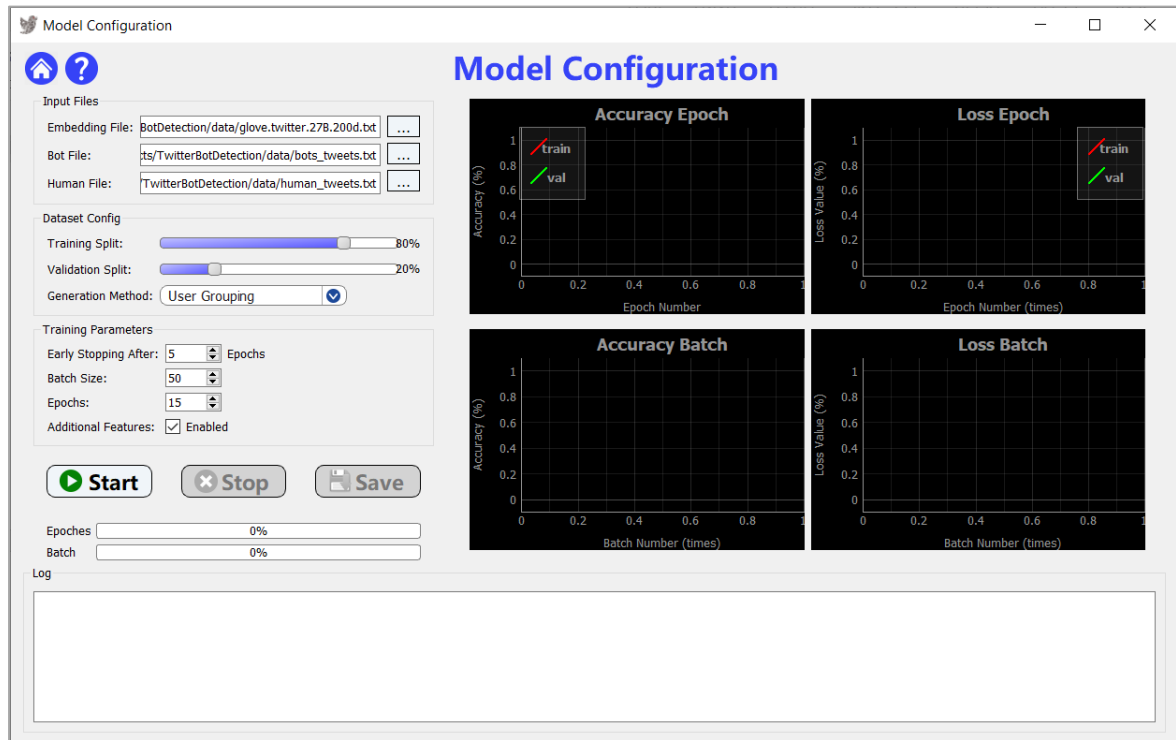
Explanations About the Application-
Main Window-
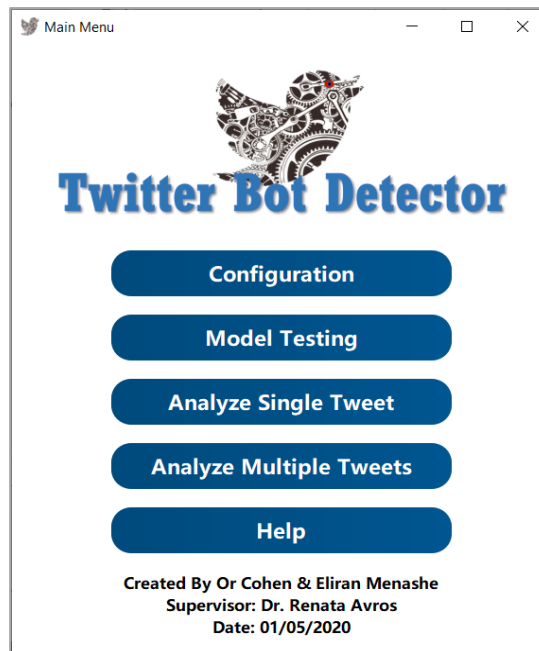
- 'Configuration'-
  This button opens the "Configuration" window for creating a new model.

- 'Model Testing'-
  This button opens the "Model Testing" window for testing the accuracy of the existing model.

- 'Analyze Single Tweet'-
  This button opens the "Analyze Single Tweet" window for predicting a single tweet.

- 'Analyze Multiple Tweets'-
  This button opens the "Analyze Multiple Tweets" window for predicting multiple tweets from a dataset file.

- 'Help'-
  This button opens the instructions about the system that contains explanations about each button in each window in the system.

Model Configuration-

- <u>'Home Button'-</u>
  This button will back to the previous window - "Main Window".

- <u>'Help Button (?)'-</u>
  This button opens the instructions about the system that contains explanations about each button in each window in the system.

- <u>'Input Files'-</u>
    - <u>'Embedding File'-</u> Choosing an embedding file for training.
    - <u>'Bot File'-</u> Choosing a bot dataset file.
    - <u>'Human File'-</u> Choosing a human dataset file.

- <u>'Dataset Config'-</u>
    - <u>'Training Split'-</u> Choosing the percentage of training split.
    - <u>'Validation Split'-</u> Choosing the percentage of validation split.
    - <u>'Generation Method'-</u>
      Selecting between two possible methods for pairs generation:
      User Grouping: This method generates the tweets pairs per each user for a better accuracy achievement.
   **Random Pairing:** This method generates random tweets pairs.

- 'Training Parameters'-
    - o 'Early Stopping'- Early stopping is a method that allows you to specify an arbitrarily large number of training epochs and stop training once the model performance stops improving on a validation dataset.
    - o 'Batch Size'- Choosing the size of the batch.
    - o 'Epochs'- Choosing the number of the epochs.
    - o 'Additional Features'- If this feature is enabled, you can get additional info between pairs such as word overlapping for getting better accuracy.

- 'Start Button'- Start training process.

- 'Stop Button'- Stop training process.

- 'Save Button'- Save the final model at the end of the training process.

- 'Epochs Progress Bar'- This progress bar represents the percentage of the current epoch number relative to the total epochs number.

- 'Batch Progress Bar'- This progress bar represents the percentage of the current batch size relative to the total batches size.

- 'Graphs'-
    - o Accuracy Epoch: This graph shows the accuracy during the training process after every epoch.
    - o Loss Epoch: This graph shows the loss during the training process after every epoch.
    - o Accuracy Batch: This graph shows the accuracy during the training process in the current batch and resets every epoch.
    - o Loss Batch: This graph shows the loss during the training process in the current batch and resets every epoch.

- 'Log'- This text box describes the progress throughout the training process.

Model Testing-

- **'Home Button'-**
  This button will back to the previous window - "Main Window".

- **'Help Button (?)'-**
  This button opens the instructions about the system that contains explanations about each button in each window in the system.

- **'Select Model'-** This combo box allows you to select an existing trained model.

- **'Input Configuration'-**
  o **'Bot File'-** Choosing a bot dataset file that contains the bot tweets.
  o **'Human File'-** Choosing a human dataset file that contains the human tweets.
  o **'Bot Tweets'-** Choosing the number of tweets for random selection from the bot file.
  o **'Human Tweets'-** Choosing the number of tweets for random selection from the human file.

- <u>'Predict Button'-</u> Start predicting process.

- <u>'Stop'-</u> Stop predicting process.

- <u>'Export'-</u> Save the results as excel file.

- <u>'Model Accuracy'-</u> This label shows the final accuracy percentage of the model at the end of the predicting.

- <u>'Bar chart'-</u>
  This chart shows the correct/incorrect prediction percentage for bots and human.
  - <u>'Threshold'-</u> Select the threshold for classification.
  - <u>'Update Button'-</u> This button updates the chart based on the threshold.

- <u>'Tweets Progress Bar'-</u> This progress bar represents the percentage of the current tweet relative to the total tweets.

- <u>'Batch Progress Bar'-</u> This progress bar represents the percentage of the current batch size relative to the total batch size.

Single Tweet Analyzer-
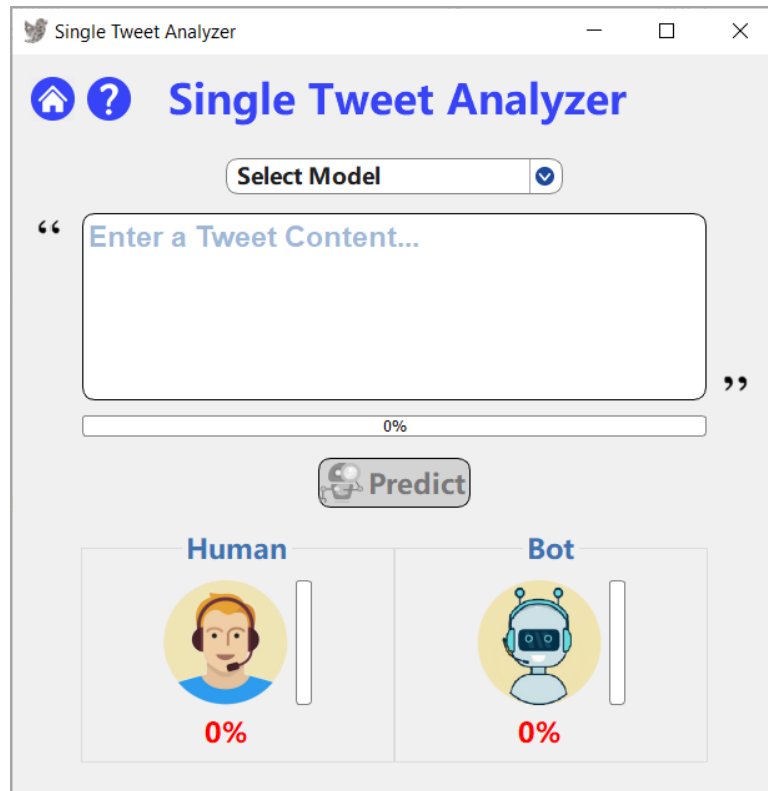
- 'Home Button'-
  This button will back to the previous window - "Main Window".

- 'Help Button (?)'-
  This button opens the instructions about the system that contains explanations about each button in each window in the system.

- 'Select Model'- This combo box allows you to select an existing trained model.

- 'Enter a Tweet Content'- In this text box, you may write or paste the tweet that you want to predict.

- 'Predict Button'- Start the predicting process.

- 'Human'- Shows the score of human classification by percentage.

- 'Bot'- Shows the score of bot classification by percentage.
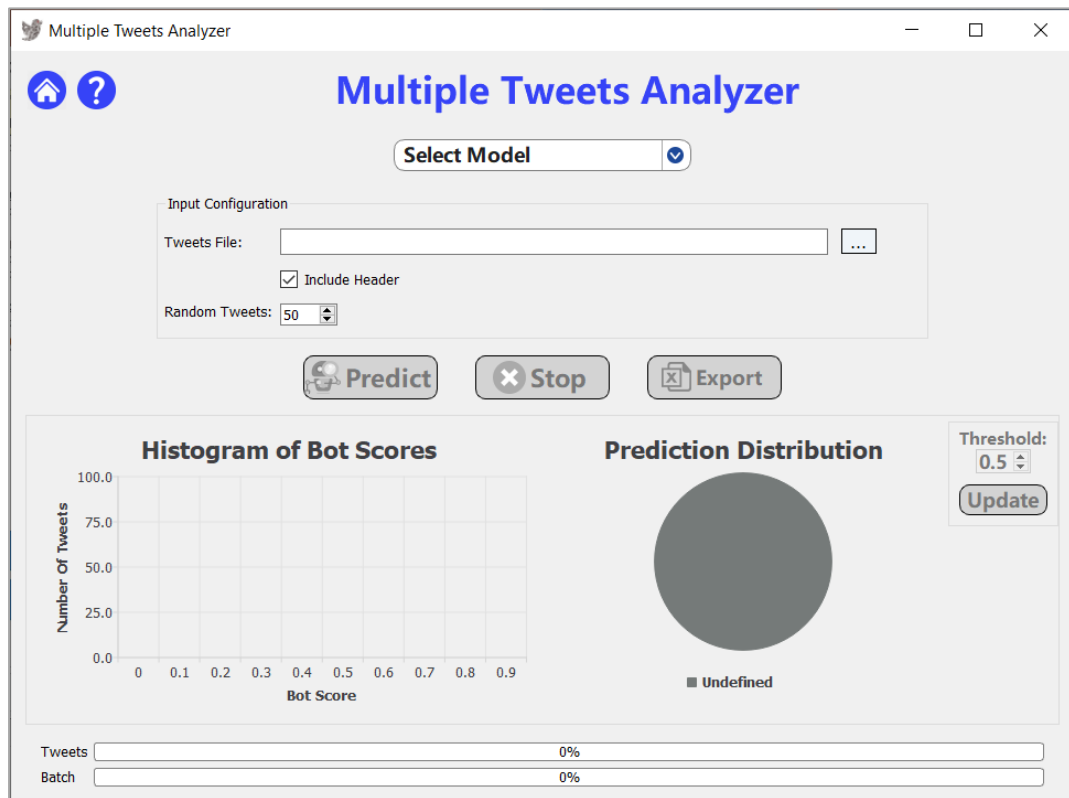
- 'Home Button'-
  This button will back to the previous window - "Main Window".

- 'Help Button (?)'-
  This button opens the instructions about the system that contains explanations about each button in each window in the system.

- 'Select Model'- This combo box allows you to select an existing trained model.

- 'Input Configuration'-
  - 'Tweets File'- You need to choose the dataset file that contains unsupervised tweets. Allowed file types: csv, txt.
  - 'Include Header'- Check this option if your dataset file contains a header.
  - 'Random Tweets'- Select the number of tweets for random selection from the dataset file.

- 'Predict Button'- Start predicting process.

- 'Stop'- Stop predicting process.

- <u>'Export'-</u> Save the results as excel file.

- <u>'Histogram of Bot Scores'-</u> Shows the prediction scores of bots as a histogram.

- <u>'Prediction Distribution Pie Chart'-</u> Show the classification as pie chart.

- <u>'Threshold'-</u> Select the threshold for a classification.

- <u>'Update Button'-</u> This button updates the charts based on the threshold.

- <u>'Tweets Progress Bar'-</u> This progress bar represents the percentage of the current tweet relative to the total tweets.

- <u>'Batch Progress Bar'-</u> This progress bar represents the percentage of the current batch size relative to the total batch size.