

CNN PARAMETER TUNER 1.0

Comprehensive Handbook

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CNN Parameter tuner 1.0

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A L L R I G H T S R E S E R V E D

CONTENTS

Introduction	5
1.1. Key Features	6
1.2. System Requirements.....	7
Installation.....	8
2.1. Downloading the Installer	8
2.2. Installation Process	9
2.3. Launching the Program.....	12
Getting Started.....	13
3.1. Running the Application.....	13
3.2. Loading image data.....	15
3.3. Train-test split settings.....	17
3.4. Epochs.....	19
3.5. Batch size	21
3.6. Activation function	23
3.7. Optimizer	24
3.8. Loss	25
3.9. Initiating the classification.....	26
Results	28
4.1. Initiating the confusion matrix	30
4.2. Initiating the classification report.....	32
4.3. Saving the accuracy graph.....	34
Magnifier & Refresh.....	37
About & Exit	39

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by

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CHAPTER

1

INTRODUCTION

Welcome to CNN Parameter Tuner 1.0! We are thrilled to introduce you to this powerful application designed to assist you in discovering the optimal parameter values for your Convolutional Neural Network Model, specifically tailored for image classification on your unique dataset.

Our comprehensive handbook has been meticulously crafted to offer you a seamless and insightful guide on navigating and harnessing the full potential of this software. We are confident that this tool will enhance your experience and streamline the process of fine-tuning your network.

Should you have any questions or require assistance along the way, please do not hesitate to reach out. We're here to ensure your journey with CNN Parameter Tuner 1.0 is both productive and enjoyable.

1.1. KEY FEATURES

- Load and analyze images (jpg, jpeg, png)
- Train-Test Split Customization
- Define Number of Epochs
- Set Batch size as per your preference
- Choose any Activation for the final Dense layer
- Select your preferred Optimizer function
- Pick a Loss function that suits your needs
- Visualize results with interactive confusion matrices
- Explore results through interactive Graphs
- Detailed Classification Reports

1.2. SYSTEM REQUIREMENTS

For basic classification purposes, we recommend utilizing any Windows-based system. To ensure optimal performance, we suggest a minimum of 16 Gigabytes of RAM. Additionally, for enhanced processing capabilities, it is highly recommended to consider systems equipped with an Intel i5 or i7 processor or later model.

In scenarios involving the processing of substantial amounts of data, we advise opting for systems with a higher memory capacity, preferably a minimum of 32 or 64 Gigabytes of RAM. This will significantly enhance the efficiency and speed of data processing, ensuring a seamless experience with large datasets.

Your attention to these hardware specifications will undoubtedly contribute to a smoother and more productive computing environment.

CHAPTER

2

INSTALLATION

For a smooth installation process, we kindly request you to follow the provided instructions diligently. Your attention to detail during this phase will greatly contribute to the successful setup of our application.

Thank you for your cooperation, and we appreciate your commitment to ensuring a seamless installation experience.

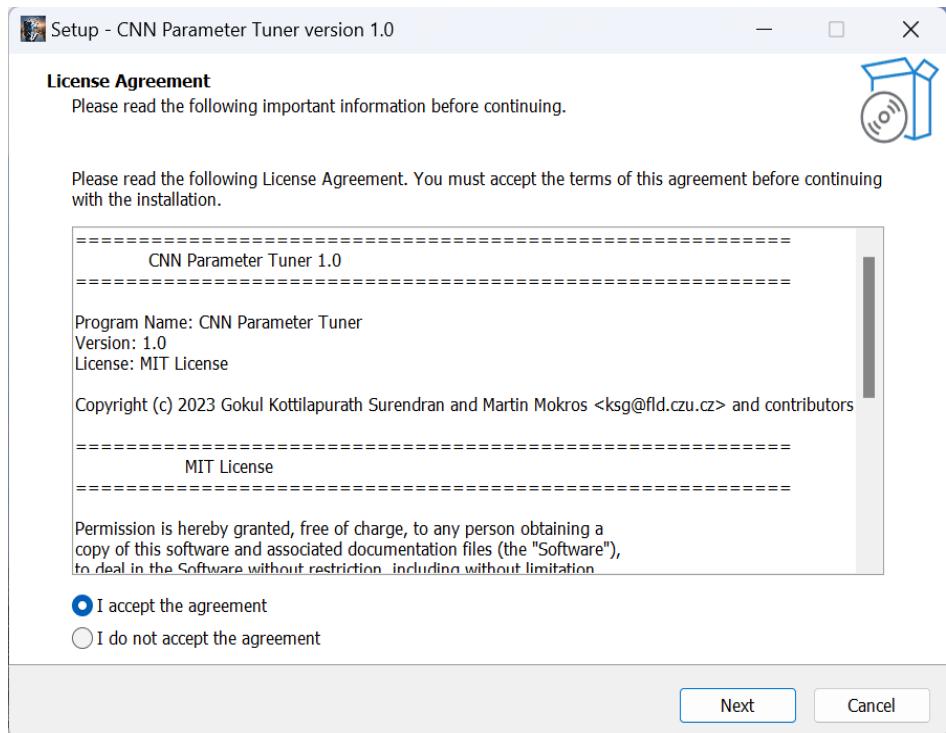
2.1. DOWNLOADING THE INSTALLER

Visit the official website or repository to download the CNN Parameter Tuner installer.

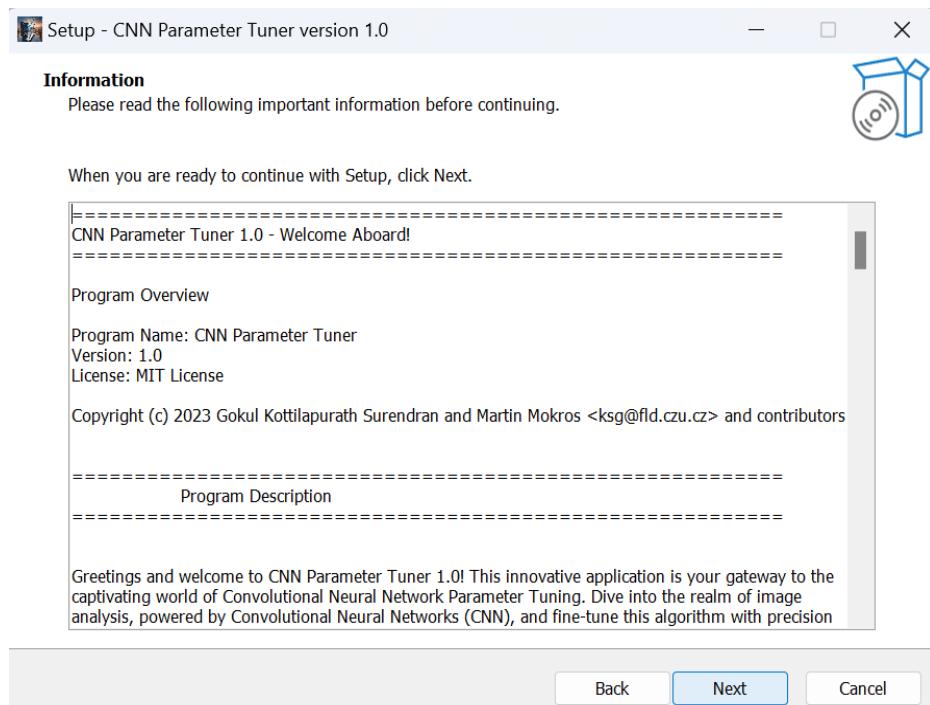
<https://github.com/Gokultcr>

2.2. INSTALLATION PROCESS

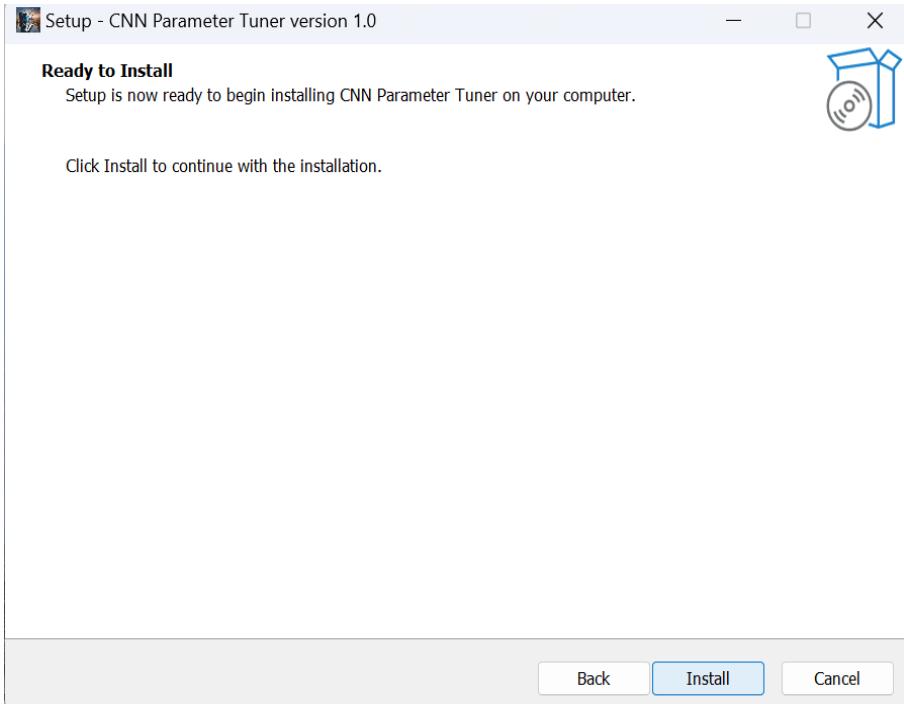
Run the installer and follow on-screen instructions for a seamless installation process.



Kindly proceed by selecting the 'I accept' option and then click on the 'Next' button



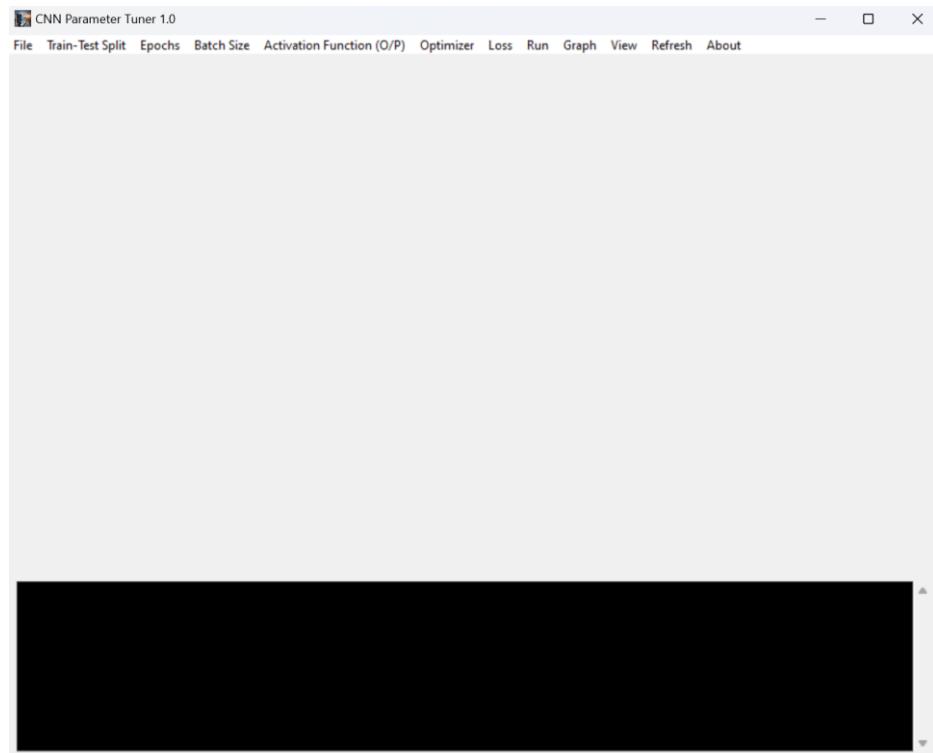
Please take a moment to review the fundamental operational details provided. Your attention to this basic working information is greatly appreciated.



Kindly proceed by clicking on the 'Install' option to initiate the application installation.

2.3. LAUNCHING THE PROGRAM

Upon successful installation, we kindly invite you to launch the program to commence your experience.



CHAPTER

3

GETTING STARTED

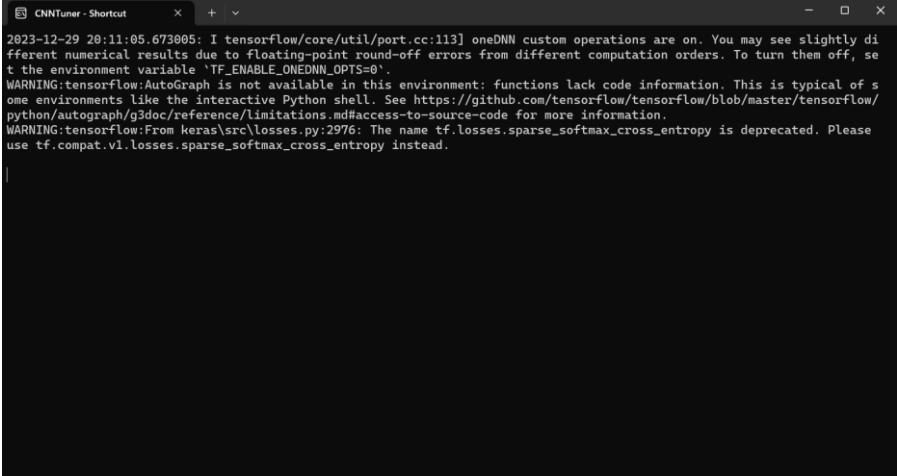
3.1. RUNNING THE APPLICATION

While executing the application, you will observe the opening of both a console window and the main application interface. The console window is designed to display warning messages, loaded data names, and a preview of results. It serves as an initial indicator of the application's functionality. It's important to note that the comprehensive results and additional details will be displayed within the main application interface.

The inclusion of the console window is intended to provide transparency and assurance regarding the application's operational status. Your understanding of this process is sincerely appreciated.

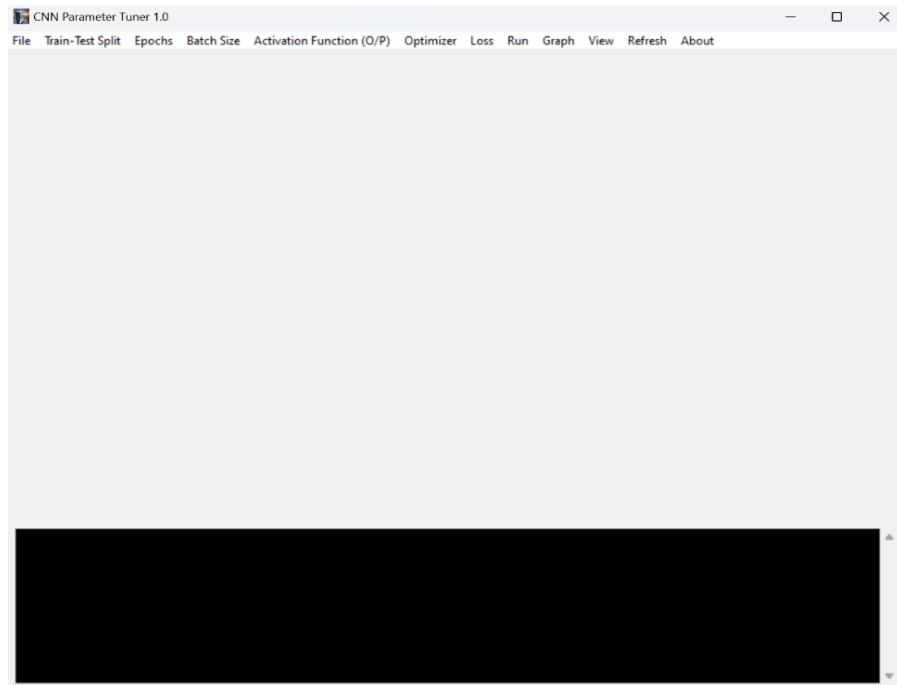
CNN PARAMETER TUNER 1.0

Console Window:



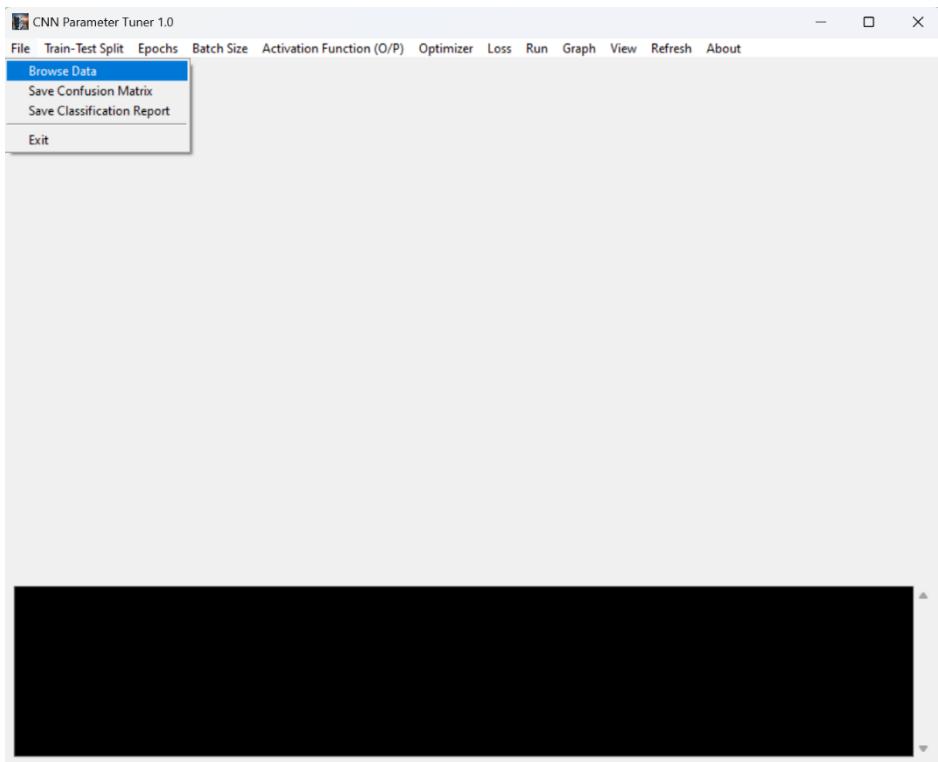
```
2023-12-29 20:11:05.673005: I tensorflow/core/util/port.cc:113] oneDNN custom operations are on. You may see slightly different numerical results due to floating-point round-off errors from different computation orders. To turn them off, set the environment variable 'TF_ENABLE_ONEDNN_OPTS=0'.
WARNING:tensorflow:AutoGraph is not available in this environment: functions lack code information. This is typical of some environments like the interactive Python shell. See https://github.com/tensorflow/tensorflow/blob/master/tensorflow/python/autograph/g3doc/reference/limitations.md#access-to-source-code for more information.
WARNING:tensorflow:From keras\src\losses.py:2976: The name tf.losses.sparse_softmax_cross_entropy is deprecated. Please use tf.compat.v1.losses.sparse_softmax_cross_entropy instead.
```

Main application interface:



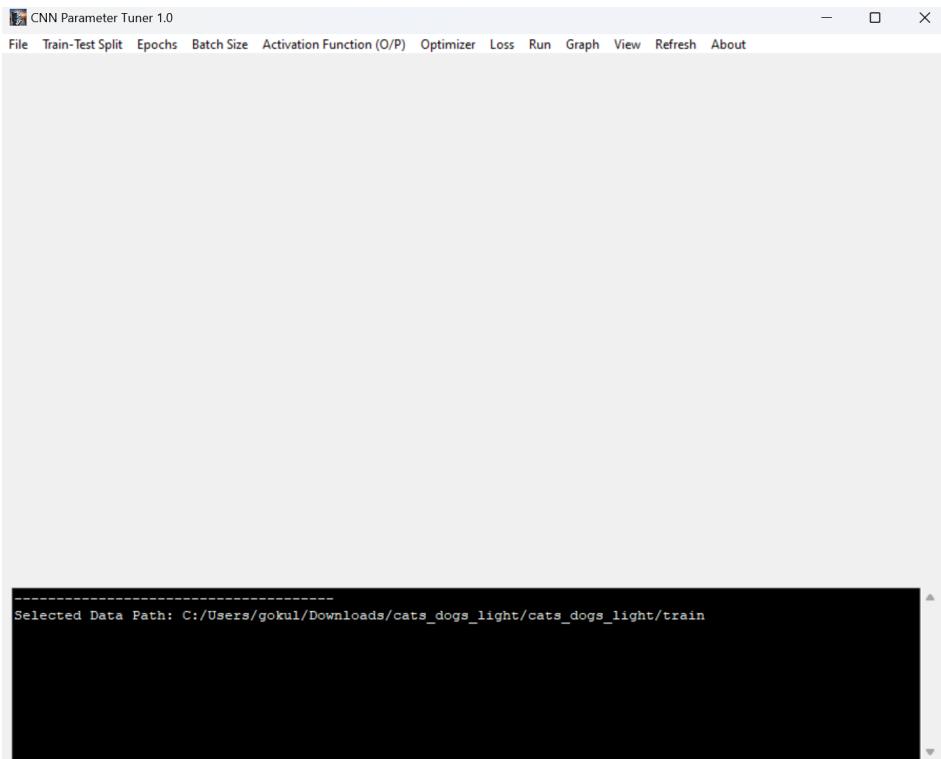
3.2. LOADING IMAGE DATA

Please navigate to the 'File' menu and select 'Browse Data' to access the option for opening a folder containing image data.



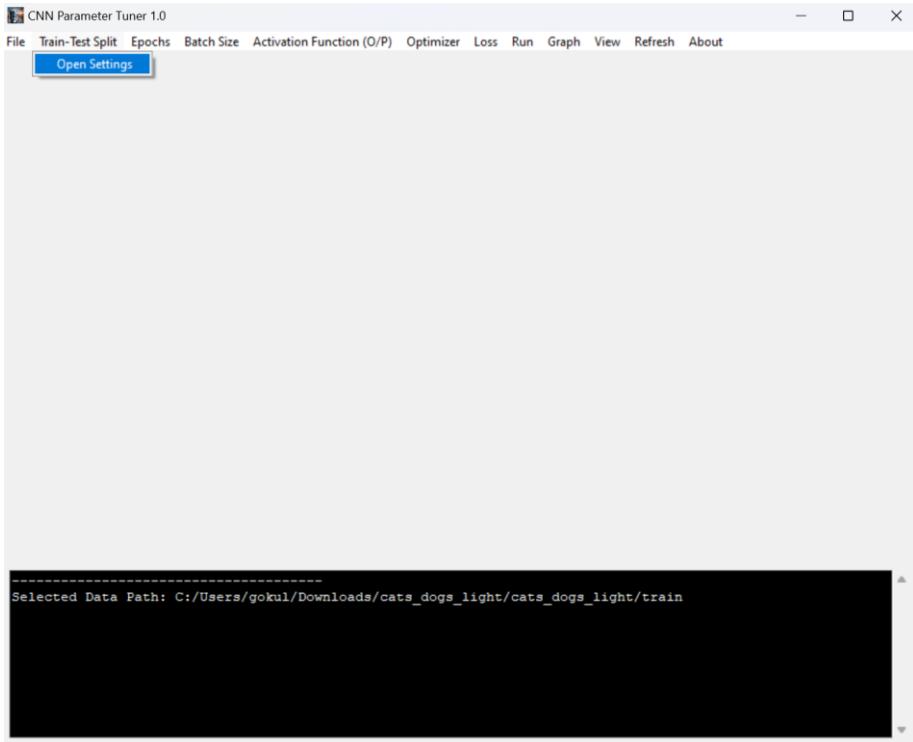
CNN PARAMETER TUNER 1.0

Upon selecting the datapath, you will find it displayed in the command prompt area within the main application.



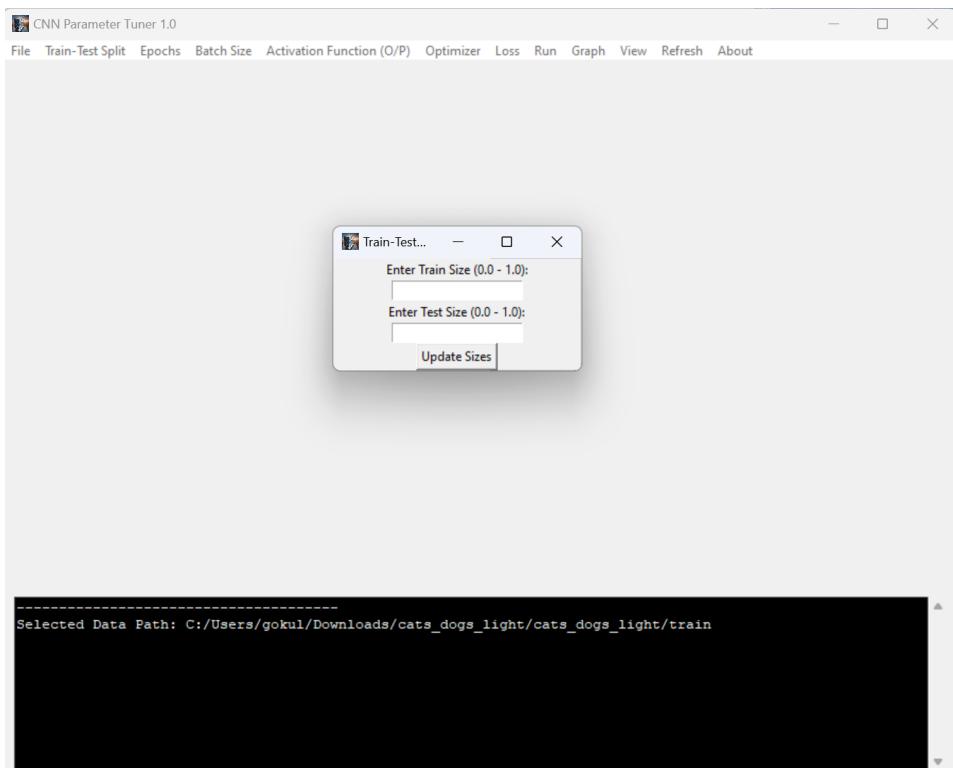
3.3. TRAIN-TEST SPLIT SETTINGS

Kindly consider adjusting the training and testing size percentages by navigating to the 'Train-Test Split' menu. However, it's worth noting that by default, the system is set to allocate 80% for training and 20% for testing.



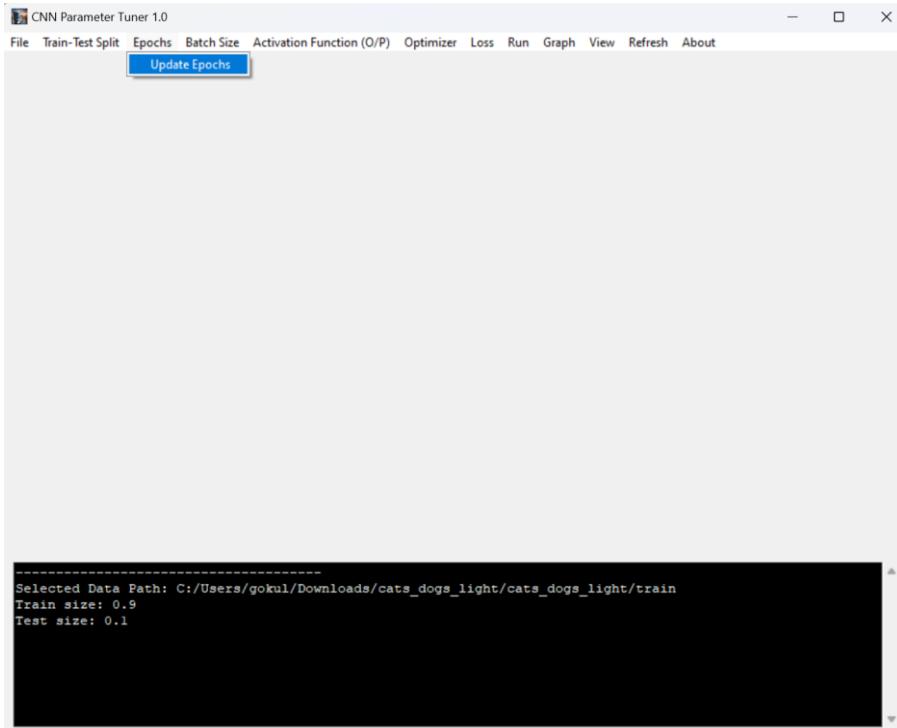
CNN PARAMETER TUNER 1.0

Should you opt for a 70% split, kindly input 0.7, and for a 60% split, please input 0.6. It's important to note that the total sum of training and testing sizes must equate to 100% (1.0). In the event that the total size exceeds this limit, the system will automatically clear all inputted details. Your careful consideration of these parameters is genuinely appreciated.



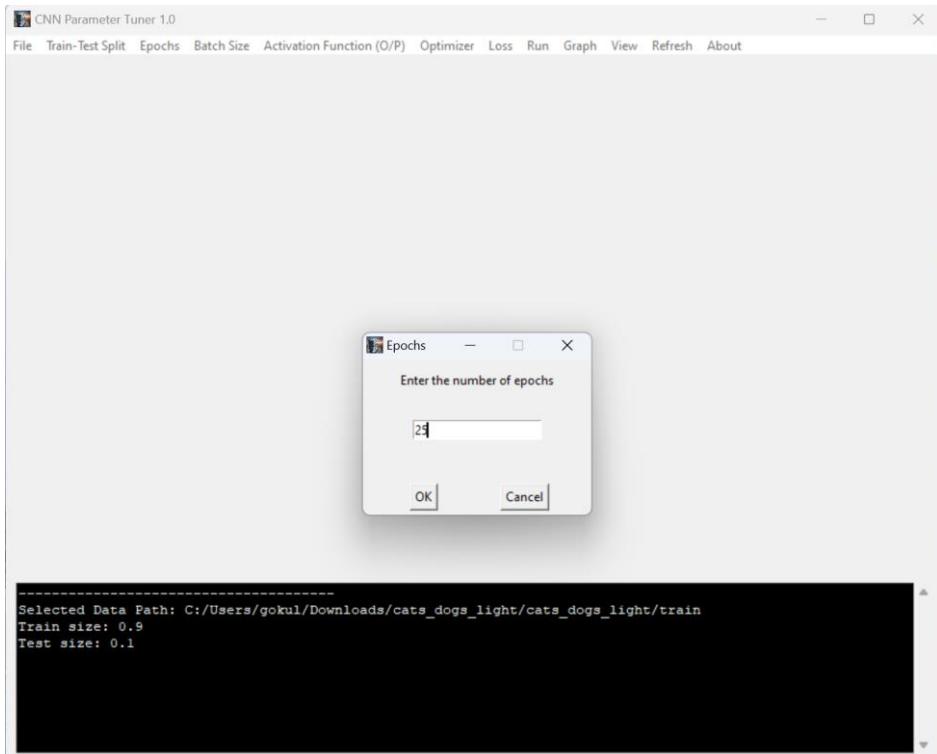
3.4. EPOCHS

Kindly set the number of epochs by accessing the "Epochs" menu and entering the desired value. Your input here will determine the number of training iterations, guiding the model towards optimal performance.



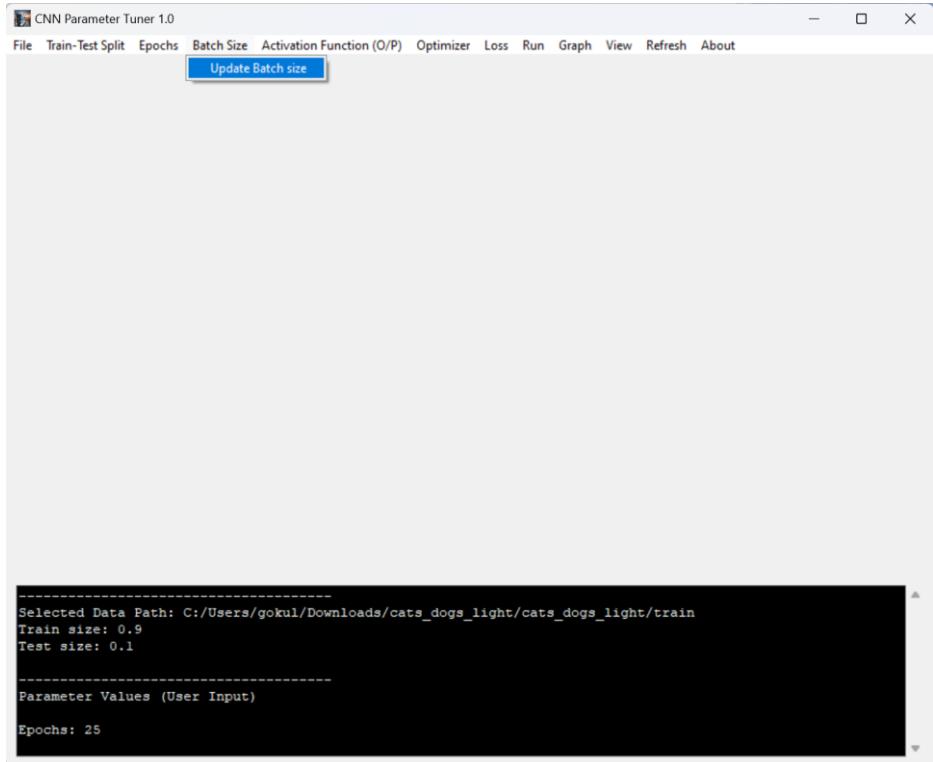
CNN PARAMETER TUNER 1.0

Enter the desired number of Epochs:



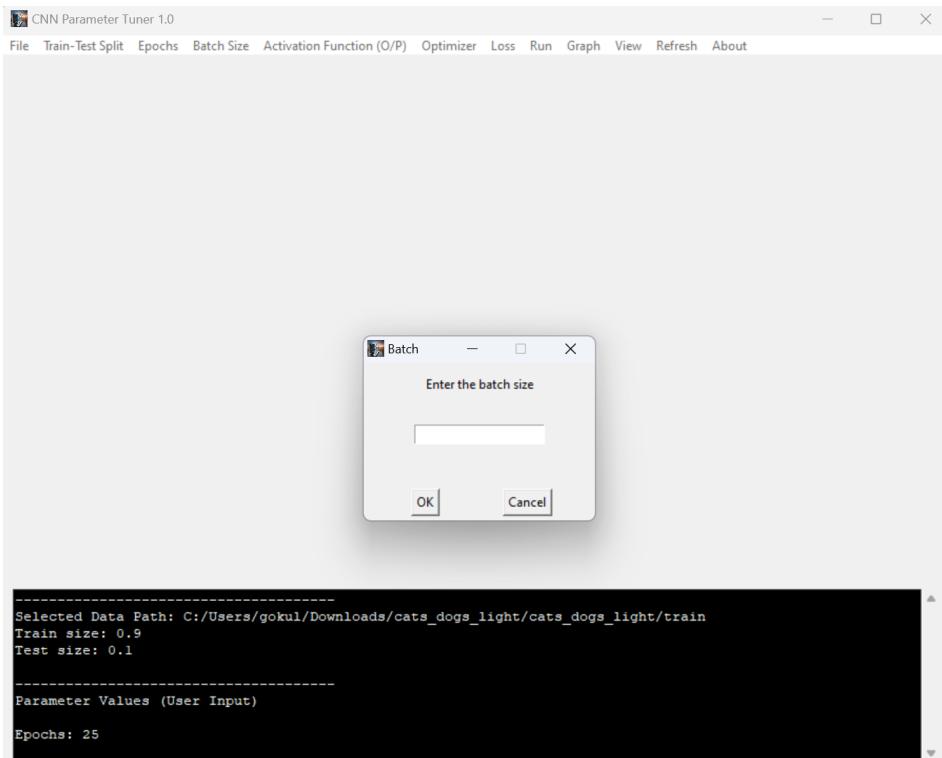
3.5. BATCH SIZE

To specify the batch size, kindly navigate to the "Batch Size" menu and input your preferred value. This parameter plays a crucial role in the training process, and tailoring it to your specific requirements can significantly impact the model's efficiency.



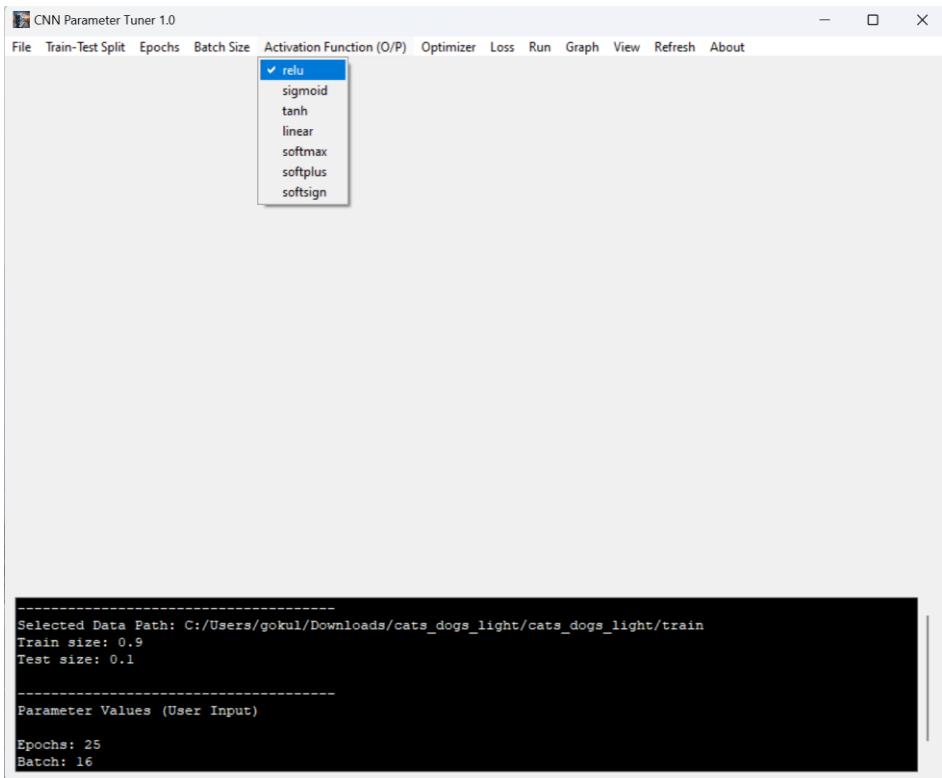
CNN PARAMETER TUNER 1.0

Enter the batch size:



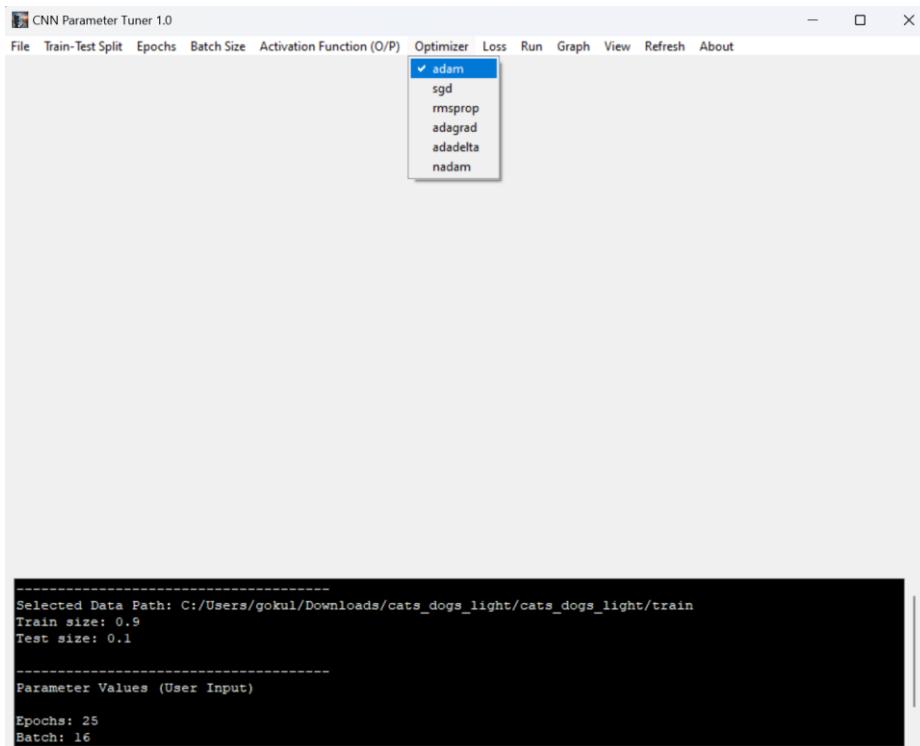
3.6. ACTIVATION FUNCTION

The "Activation Function (O/P)" menu, you have the option to choose your preferred activation function for the output dense layer. This selection is pivotal in shaping the final output of your model. Feel free to explore and select the activation function that aligns best with your objectives.



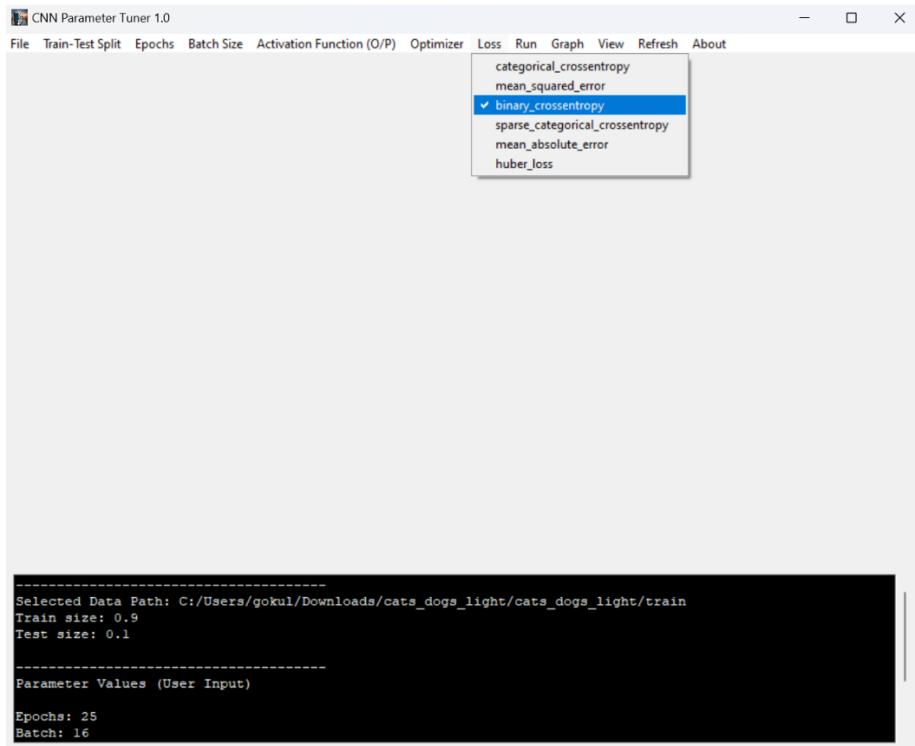
3.7. OPTIMIZER

To customize your model's optimization process, simply access the "Optimizer" menu and choose your preferred optimizer. This selection is key to enhancing the efficiency and convergence speed of your Convolutional Neural Network.



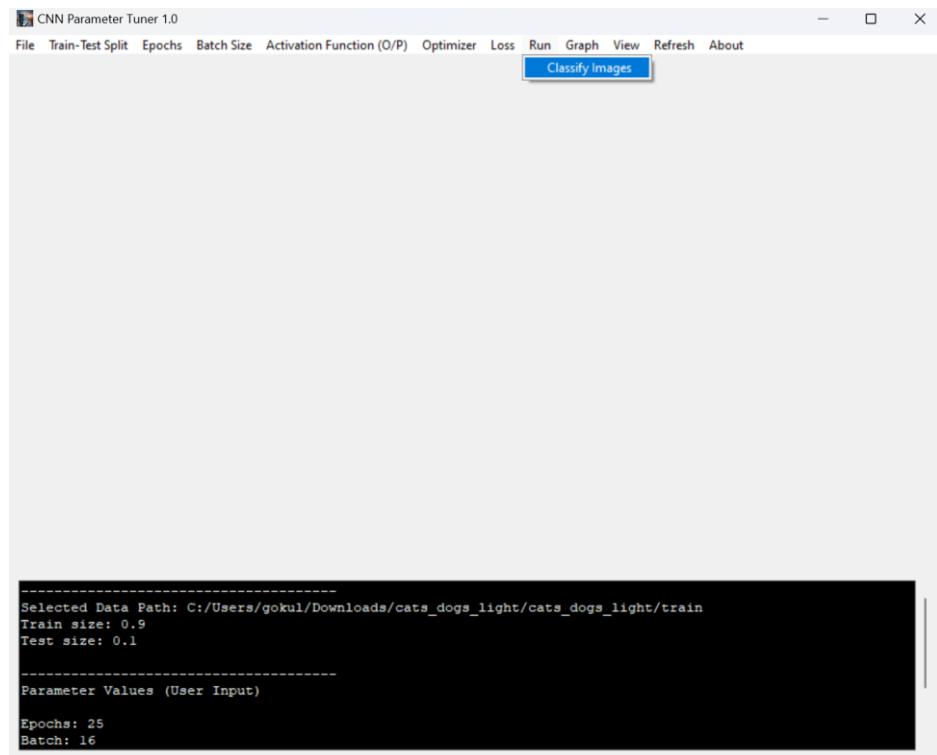
3.8. LOSS

To tailor the training process further, kindly navigate to the "Loss" menu and select the loss function that aligns with your specific objectives. This choice plays a pivotal role in guiding the model towards optimal performance and accurate predictions.

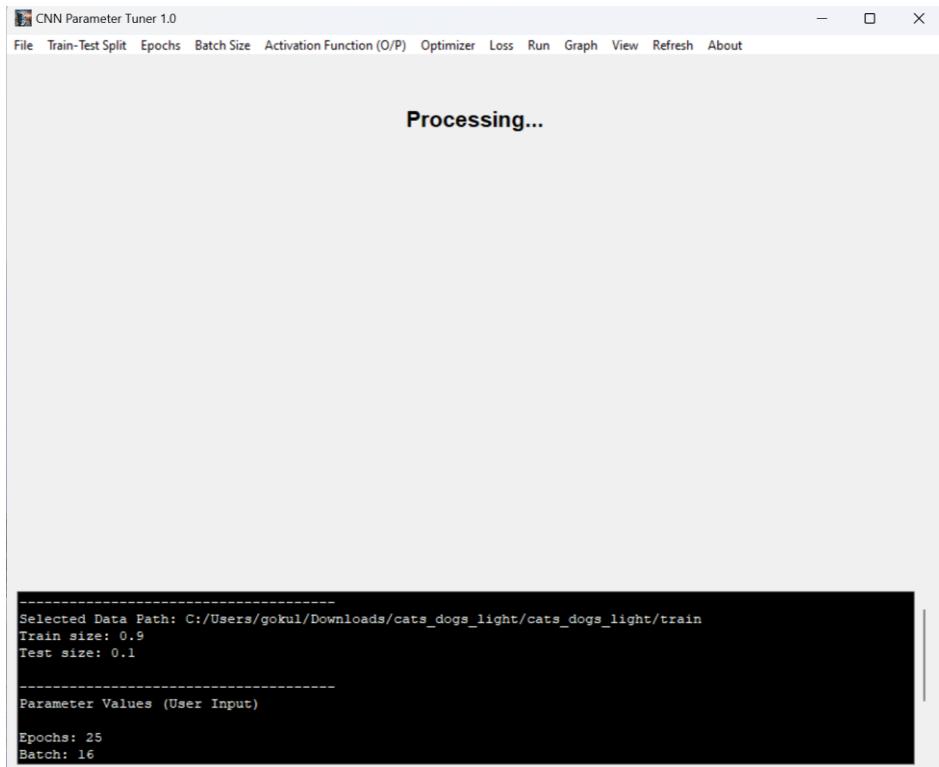


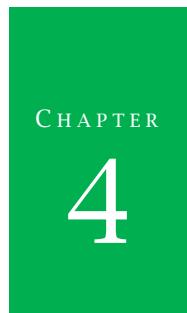
3.9. INITIATING THE CLASSIFICATION

Kindly proceed by clicking on the 'Run' menu, and then select 'Classify Images' to initiate the classification process.



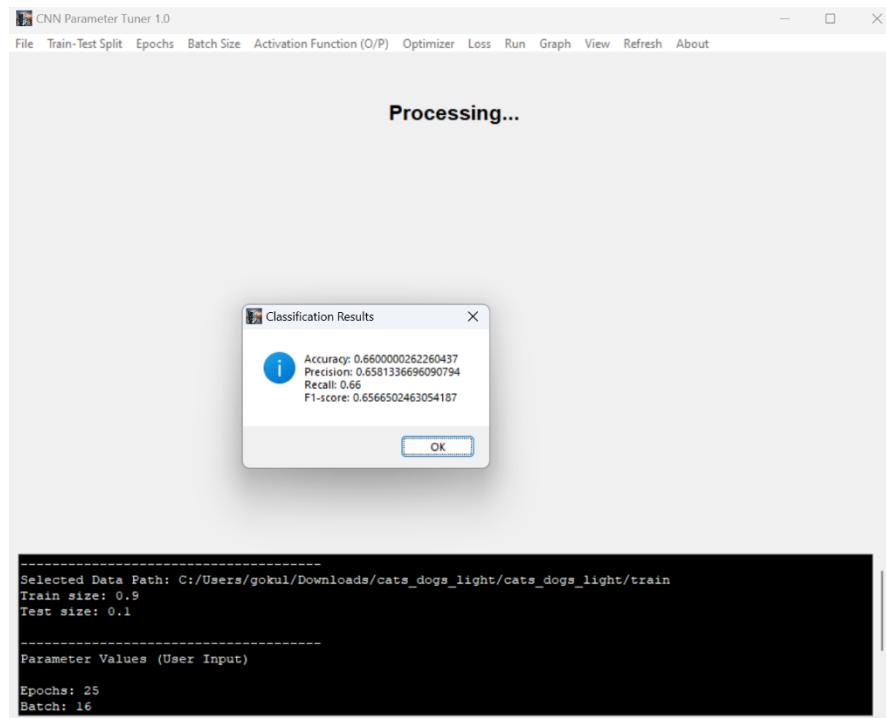
Upon initiation of the processing, the system will indicate 'Processing' to signify that the operation has commenced. Your patience during this phase is greatly appreciated.





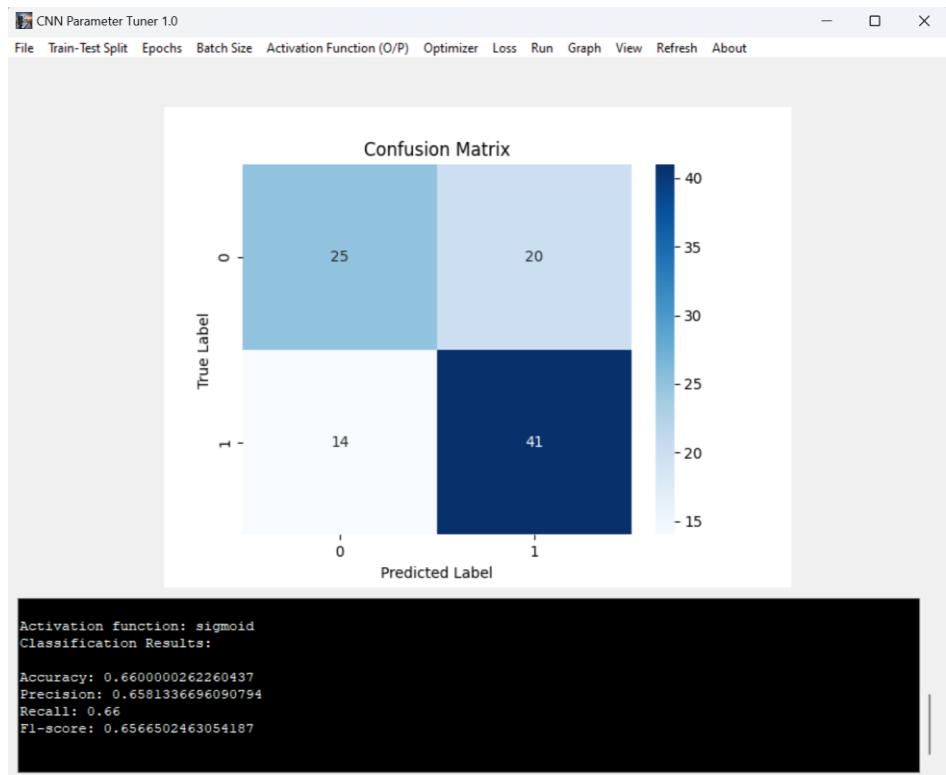
RESULTS

After the completion of processing, a popup will display the main accuracy scores. Kindly click 'OK' to finalize the process and access the results.



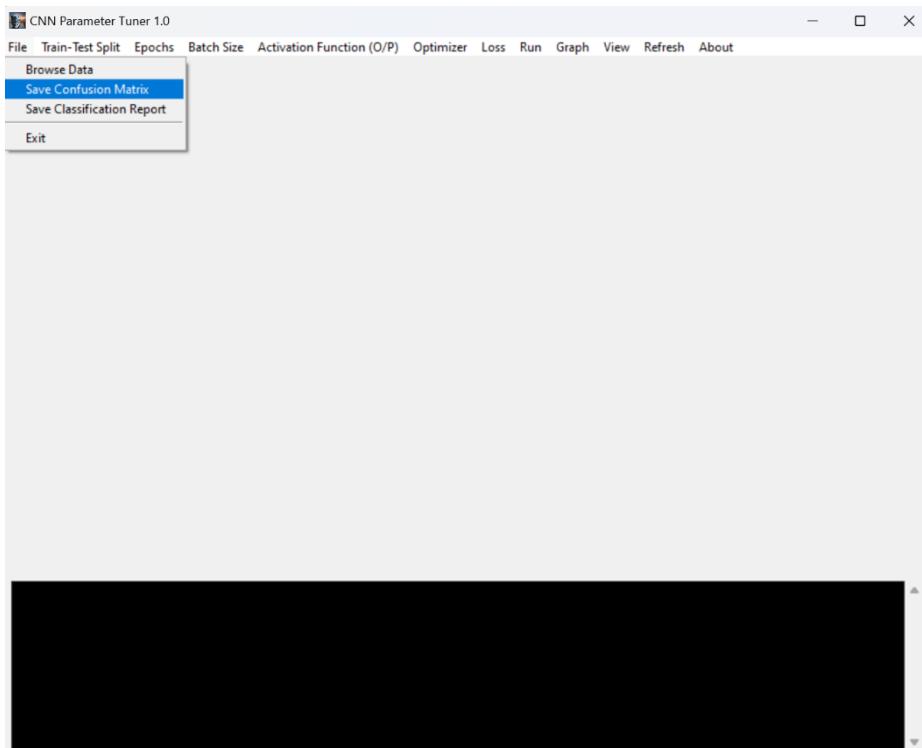
The confusion matrix will be presented in the main application window. Your attention to this crucial element is highly valued.

Additionally, the command prompt in the main application window will display essential information such as the selected data path, training-testing size, accuracy matrices, and so on.

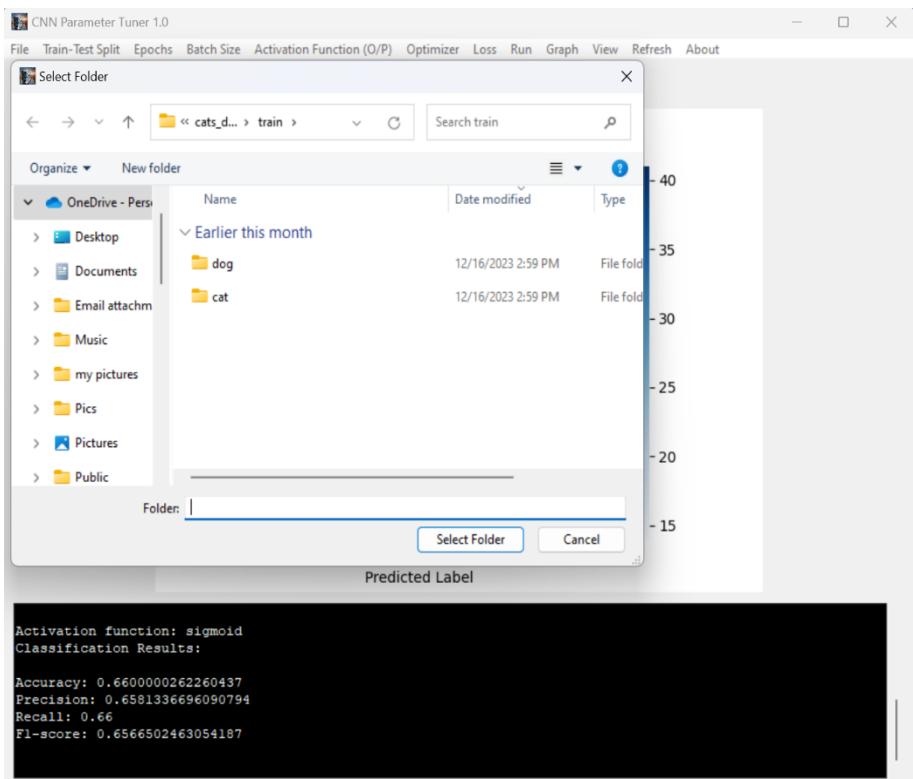


4.1. INITIATING THE CONFUSION MATRIX

To save the confusion matrix as a PNG image, kindly navigate to the 'File' menu and select the 'Save Confusion Matrix' sub-menu. The system will prompt you to choose a folder for saving; please select the desired folder for the storage of the confusion matrix image.

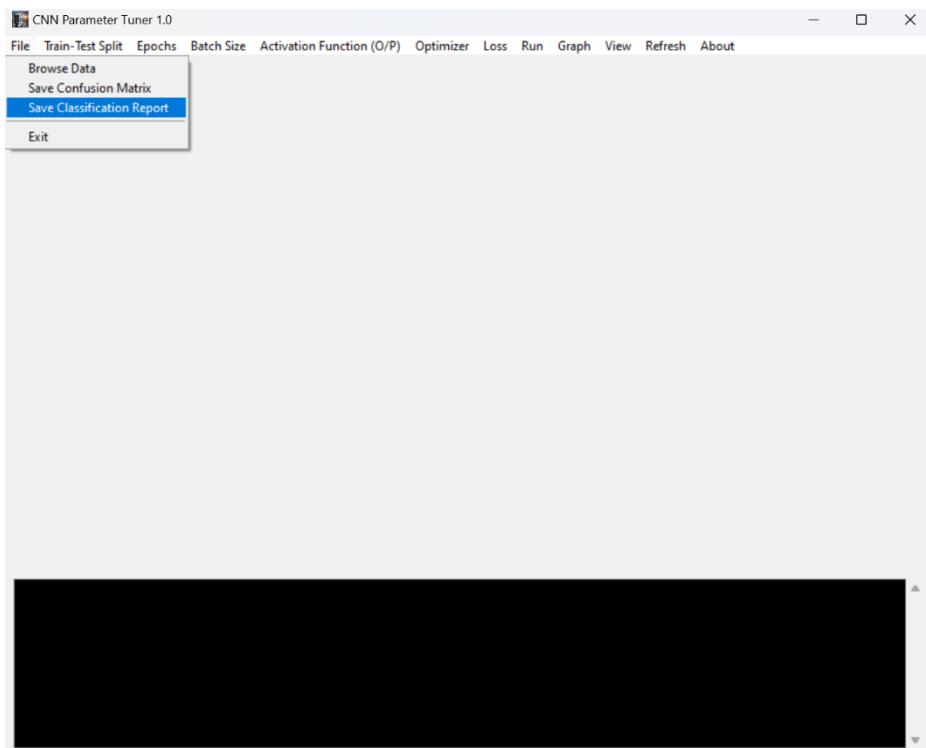


Select the folder:

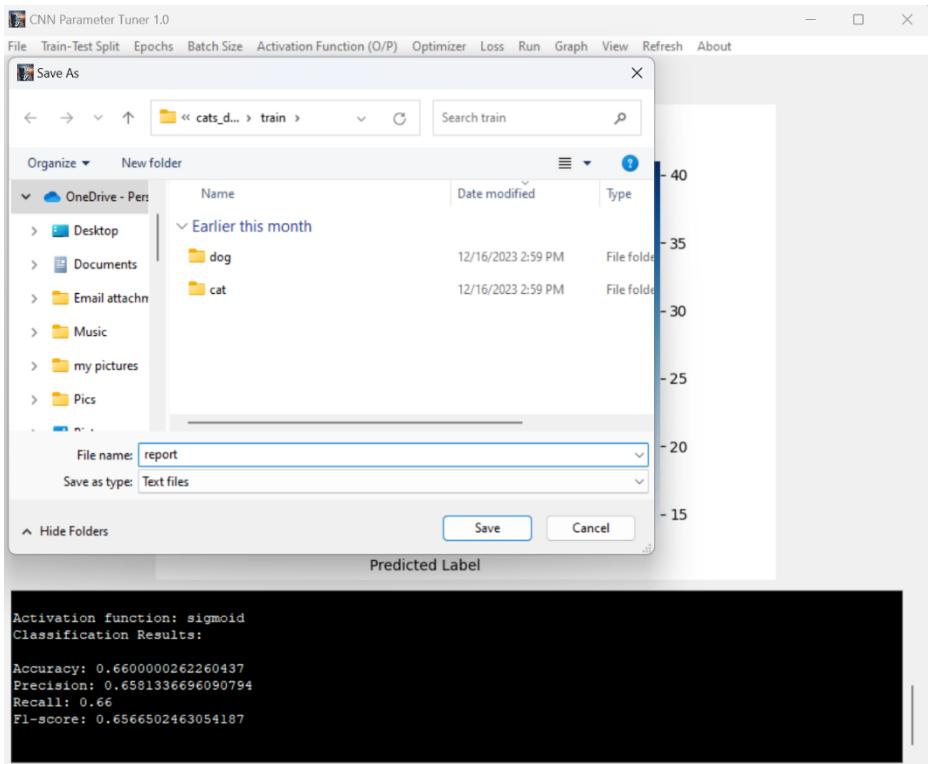


4.2. INITIATING THE CLASSIFICATION REPORT

To retain the detailed classification report as a TXT file for future reference, please navigate to the 'File' menu and select the sub-menu 'Save Classification Report.' You will be prompted to choose a location for saving, kindly select the desired folder, and provide a suitable file name.

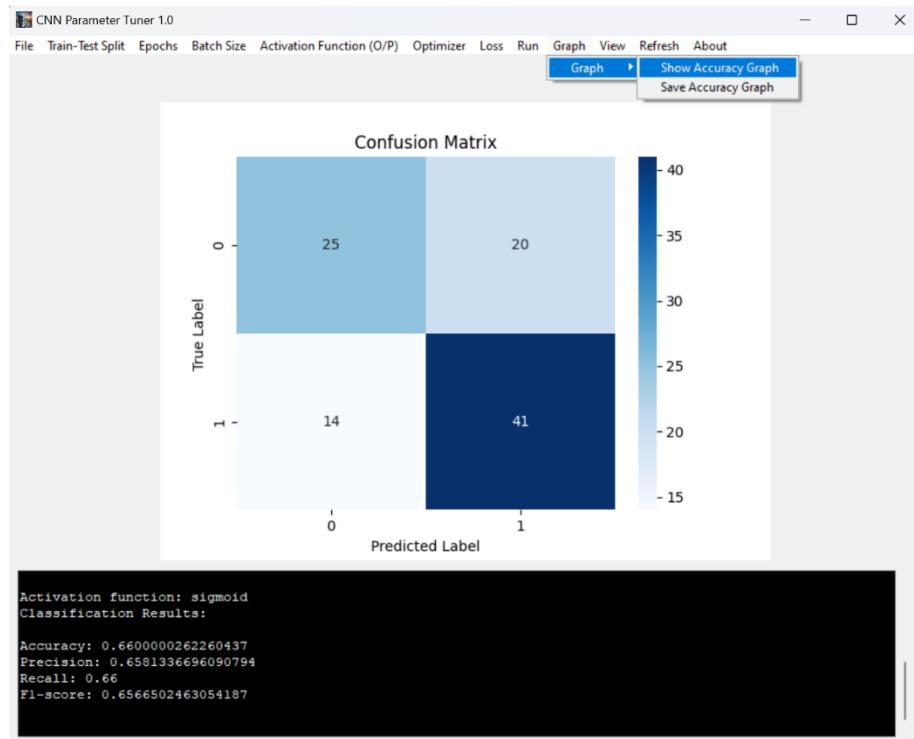


Provide the file name for Classification report:

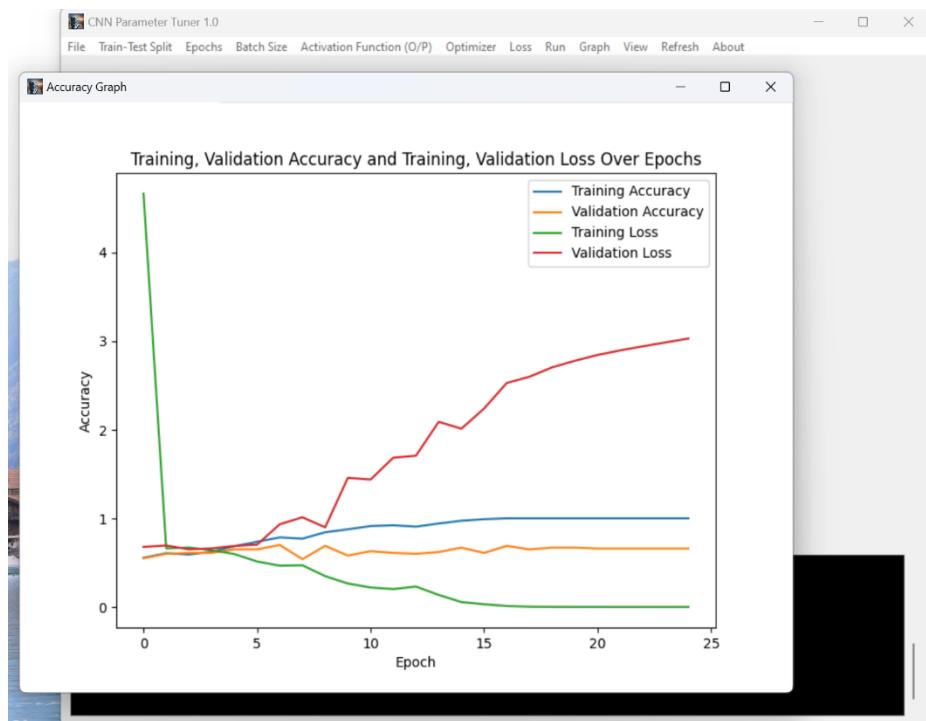


4.3. SAVING THE ACCURACY GRAPH

For a comprehensive overview of your model's accuracy, simply click on the "Graph" menu and then select "Show Accuracy Graph." This will provide you with a visual representation of the accuracy trends, allowing you to assess the performance of your Convolutional Neural Network more effectively.

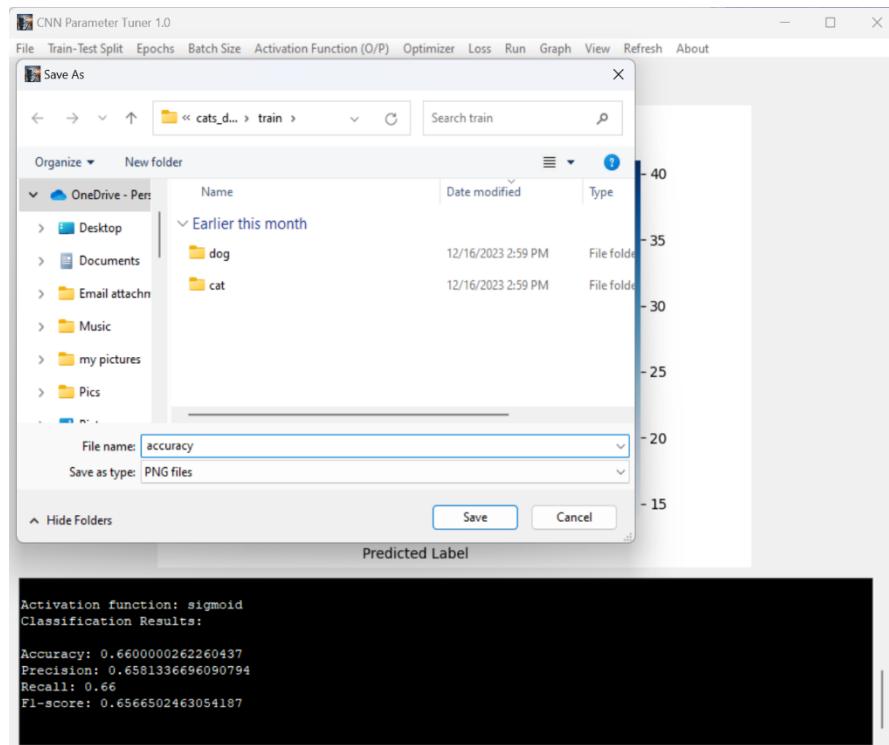


Displays the graph :



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To save the graph as png file, click on “Save Accuracy Graph” :

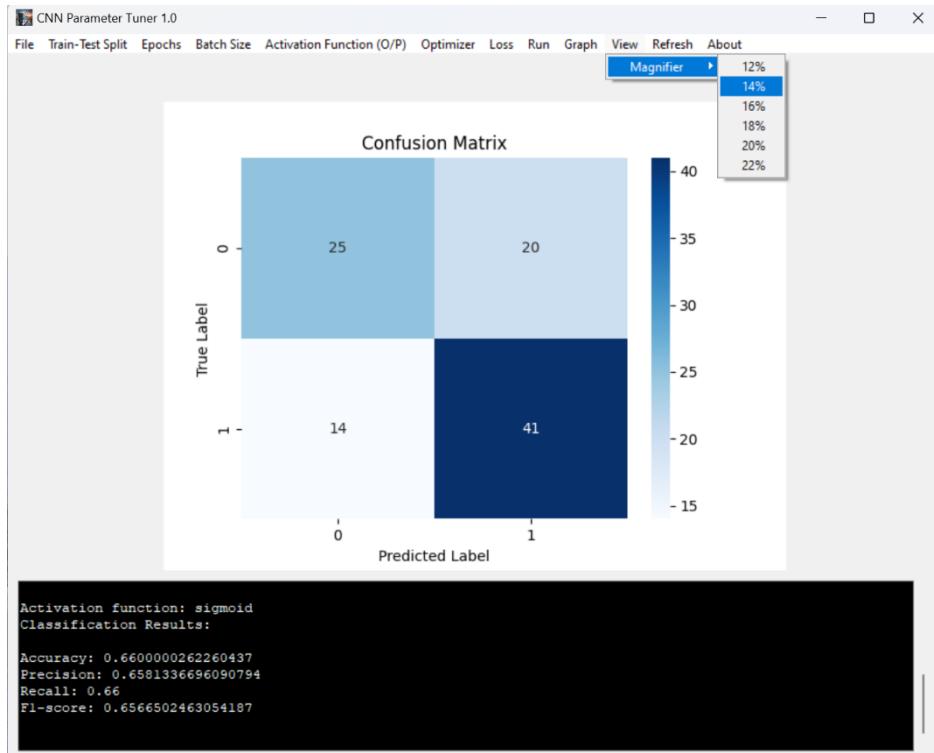


CHAPTER

5

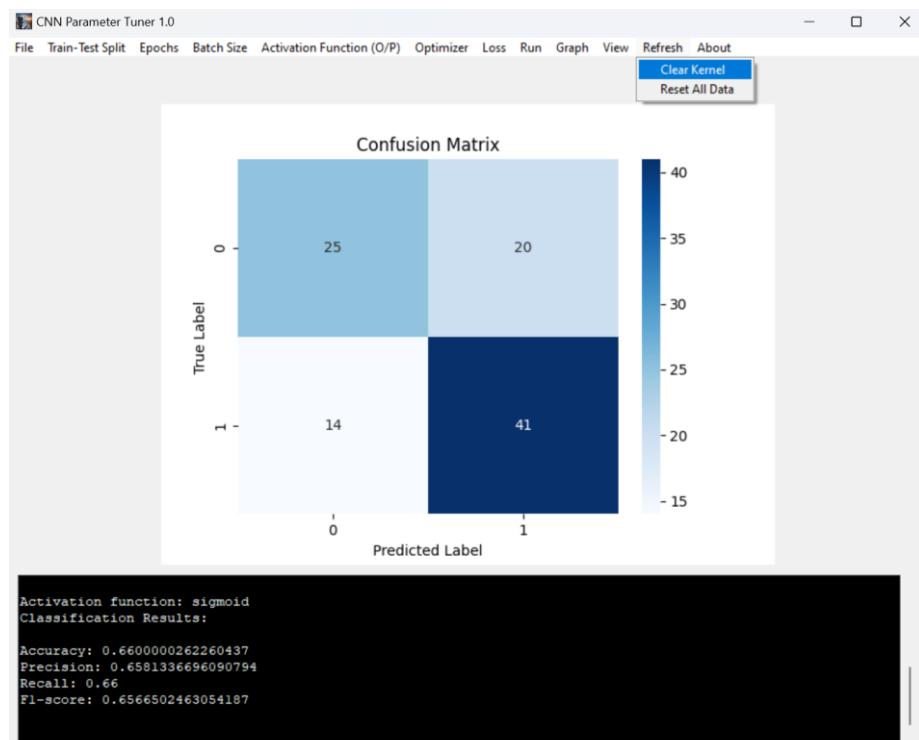
MAGNIFIER & REFRESH

To enlarge the application command prompt area for better visibility, kindly access the 'View' menu and click on 'Magnifier' sub-menu and select the desired font size.



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The 'Refresh' menu offers valuable options for managing loaded results. Clicking on the 'Clear Kernel' sub-menu will effectively clear the kernel and refresh the command prompt area in the application. Alternatively, selecting the 'Reset All Data' sub-menu will erase all information stored in the main arrays, including the confusion matrix and other relevant data.

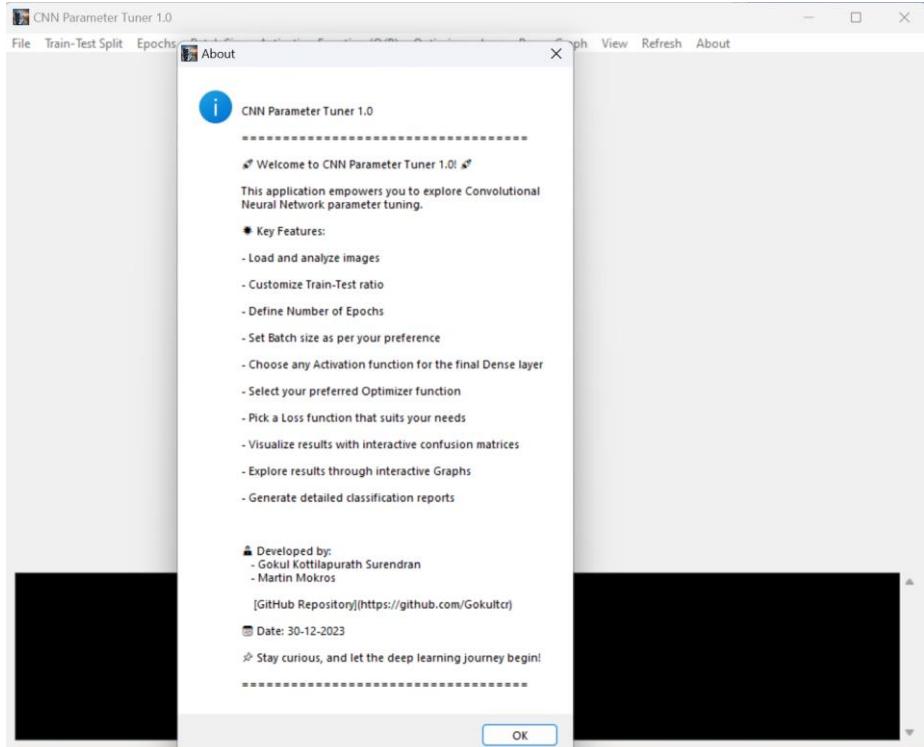


CHAPTER

6

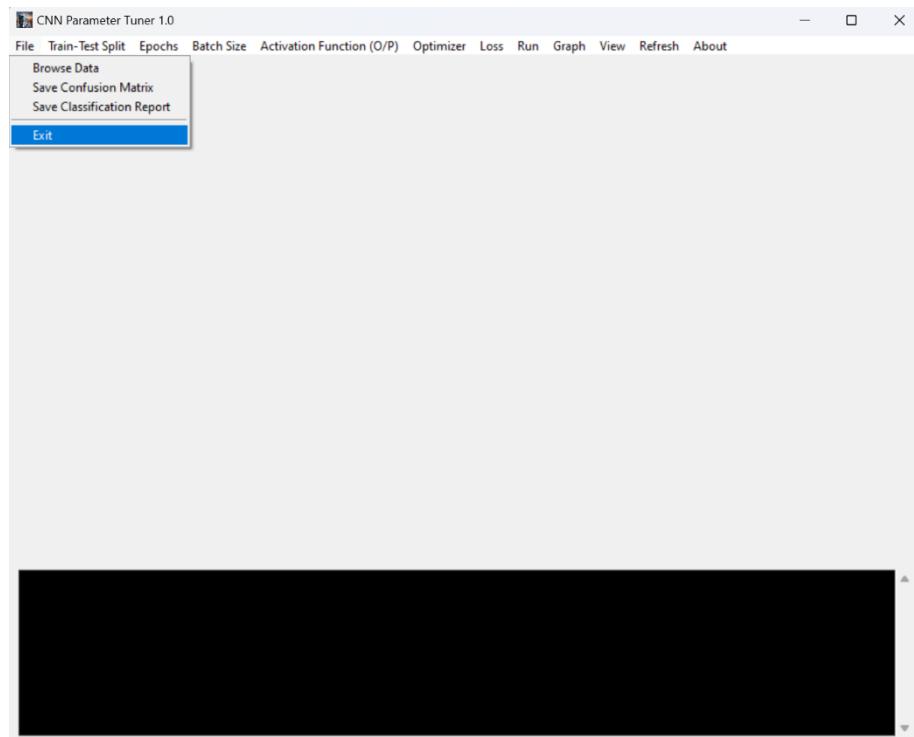
ABOUT & EXIT

The 'About' menu serves as a valuable resource, providing information about the application.



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To gracefully exit the application, kindly navigate to the 'File' menu and select the option 'Exit.' Alternatively, you can close both the main application window and the console window.



Thank you 😊