

Configuration Manual

Advanced Hybrid Ransomware Detection Using Secure BERT-GAT Framework

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Programme: MSc In Cyber Security **Year:** 2025-2026
Module: MSc (Research) Practicum/Internship Part 2
Lecturer: Michael Prior
Submission Due Date: 11-12-2025
Project Title: Advanced Hybrid Ransomware Detection Using SecureBERT-GAT Framework
Word Count: 182 **Page Count:** 4

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Signature: DEVENDRA KUMAR THOTA
Date: 11-12-2025

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Configuration Manual

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Step 1 : Launching the colab environment (navigating to google colab website)

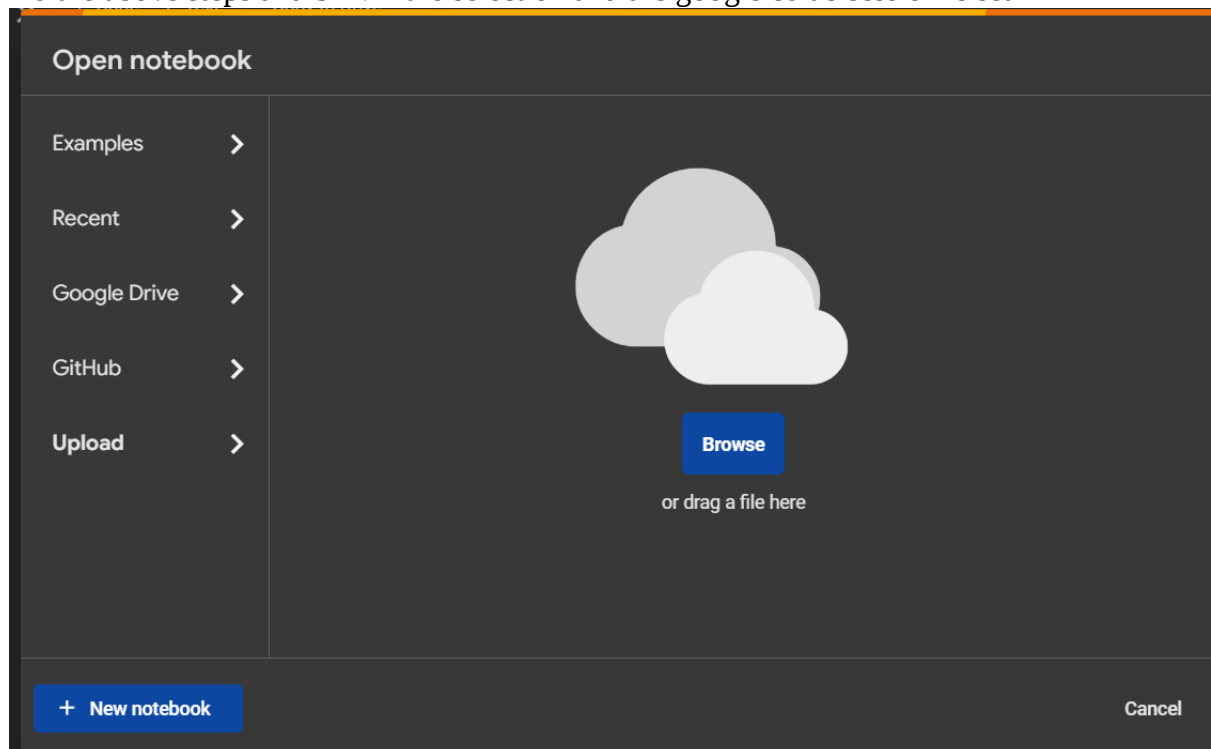
Step 2: Sign in into the google account

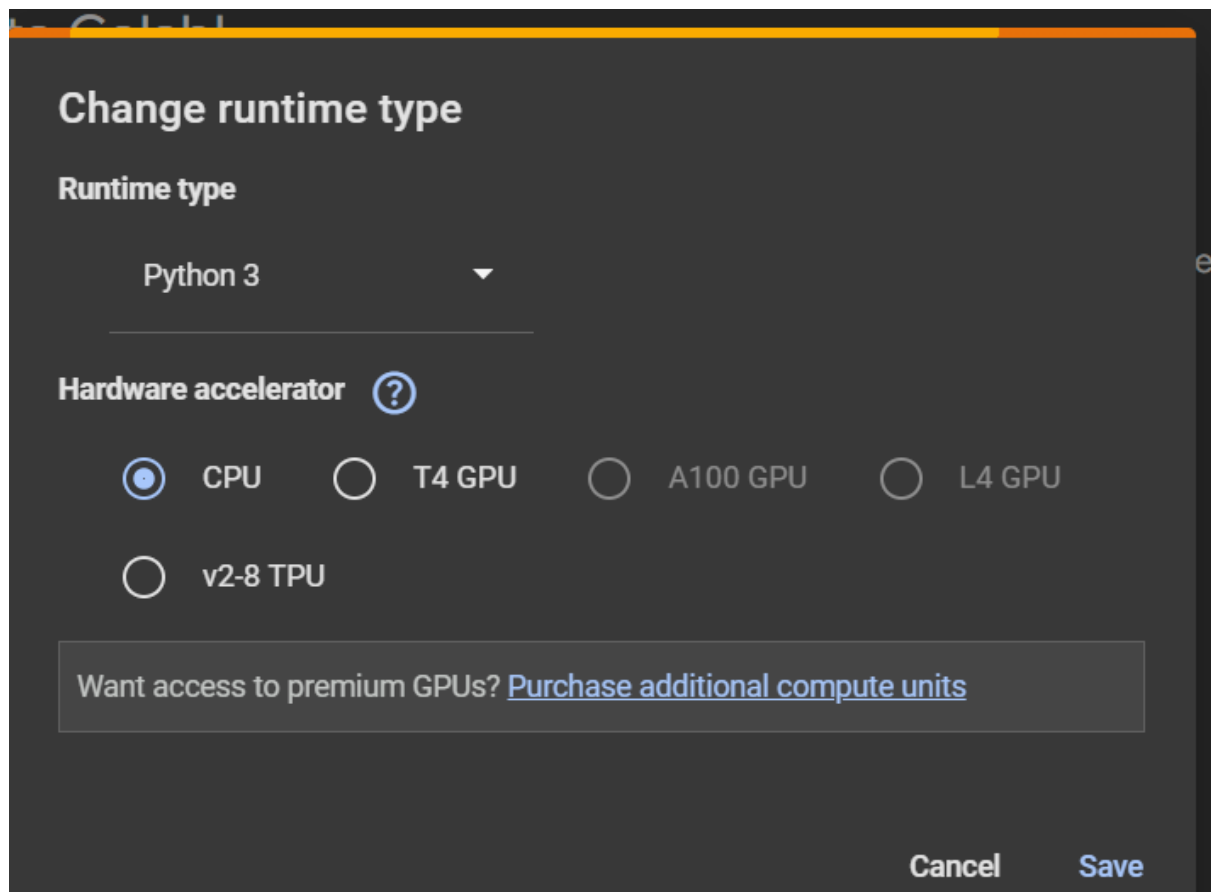
Step 3:uploading the ipynb file /notebook

Step 4:Enabling the GPU Acceleration (in this change the runtime)

Step 5 : change the hardware accelerator to T4 GPU

Do the above steps and SAVE the selection and the google colab session is set





2. Setting up the environment

Step 1: open the google colab session

Step 2: Sign in to your Gmail

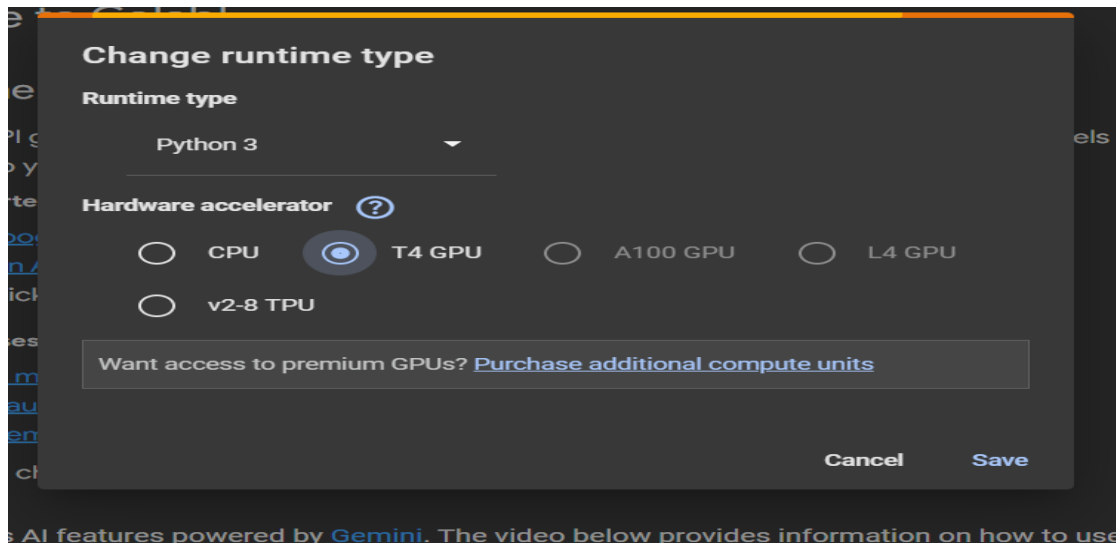
Step 3: start a new note book

Step 4 : Activate the GPU acceleration

Step 5: Create a folder on the website

1. Upload the file

Step 6: You can see the results now



3 . Loading the data

Step 1: Load the data into the note book (update the local path)

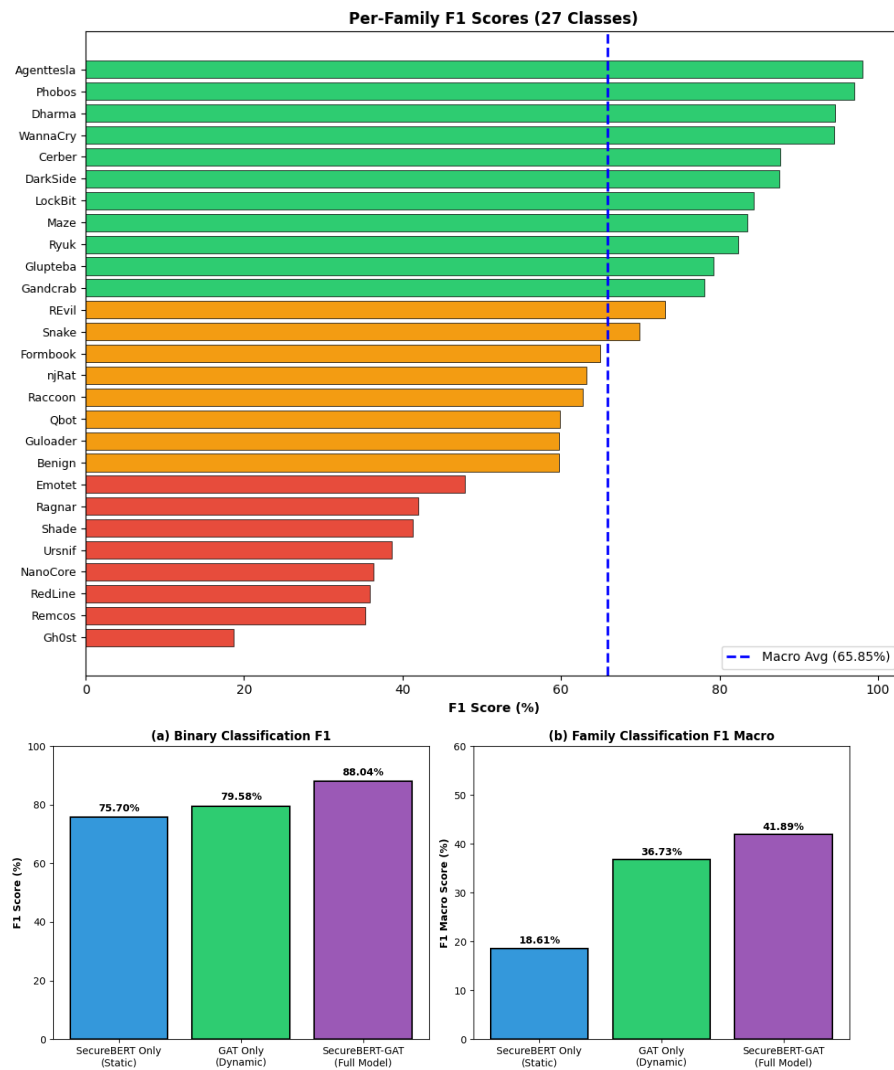
```

44
45 warnings.filterwarnings('ignore')
46
47 # Configuration
48 class Config:
49     # Data paths - Auto-detect environment
50     IN_COLAB = 'google.colab' in str(globals().get('get_ipython', lambda: None)())
51
52     if IN_COLAB:
53         DATA_PATH = "Final_Dataset_without_duplicate.csv"
54         OUTPUT_DIR = "GAT_outputs"
55     else:
56         # Local path - update as needed
57         DATA_PATH = "Final_Dataset_without_duplicate.csv"
58         OUTPUT_DIR = "GAT_outputs"
59
60     # Model parameters - STABLE configuration
61     SECUREBERT_MODEL = "ehsanaghai/SecureBERT"
62     MAX_SEQ_LENGTH = 128
63     EMBEDDING_DIM = 128
64     DYNAMIC_HIDDEN = 256
65     FUSION_DIM = 256
66     DROPOUT = 0.3
67
68     # Training parameters - OPTIMIZED for best performance
69     BATCH_SIZE = 32
70     EPOCHS = 150 # More epochs for focal loss to work
71     LEARNING_RATE_BERT = 2e-5
72     LEARNING_RATE_GAT = 2e-4
73     LEARNING_RATE_FUSION = 2e-4
74     WEIGHT_DECAY = 0.01

```

Once the dataset is placed properly and then run the code to complete the execution.

4. Results



5. References

Google Colab (Reference): <https://colab.research.google.com/>

Demirkiran, F., Çayır, A., Ünal, U., & Dağ, H. (2022). An ensemble of pre-trained transformer models for imbalanced multiclass malware classification. *Computers & Security*, 121, 102846. DOI: 10.1016/j.cose.2022.102846