

Configuration Manual

MSc Research Project MSc Cybersecurity

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MSc Project Submission Sheet

School of Computing

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Submission Due

Date: 16/09/2024

Project Title: Real-Time Detection of Social Engineering Threats in Social Media

Posts

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Signature: Jagadish Maranachakanahalli Dhananjaya

Date: 14/09/2024

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1 Introduction

This configuration manual provides comprehensive instructions of 'Real-Time Detection of Social Engineering Threats in Social Media Posts' for building and running the Flask web application on a Windows system using the PyCharm IDE. This application facilitates image uploading and analysis using YOLO for object detection and includes a system for detecting potential threats based on uploaded content.

2 System Requirements

2.1 Hardware Requirements

• Processor: Minimum Intel Core i5 or equivalent

• RAM: Minimum 8 GB

• Storage: Minimum 1 GB of free space for application and dependencies

2.2 Software Requirements

Operating System

Windows: Windows 10 or later (for development environment) **macOS**: macOS 10.14 or later (for development environment) **Linux**: Ubuntu 20.04 or later (for development environment)

• YOLO (You Only Look Once)

Weights File: yolov3.weights (Kaggle, n.d.) Configuration File: yolov3.cfg (Elkhiati, 2018) Class Names File: coco.names (Chhibber, 2021)

- Pyton 3.6 or later
- CSS
- HTMl 5
- Bootstrap

3 Setting Up the Development Environment

Step 1: Install Required Software

- Download and install Python from the official website (Python.org, n.d.)
- Download and install Pycharm from the official website (Brains, n.d.)

Step 2: Open PyCharm IDE

• Launch PyCharm and create a new project by selecting **Create New Project** from the welcome screen.

Step 3: Set Up the Project

- Name your project.
- Choose a location to save your project.
- Select New environment using Virtualenv.
- Ensure the Base Interpreter points to your Python executable.

Step 4: Create the Project

• Click Create to set up the new project.

Step 5: Install Dependencies

- Open the **Terminal** tab in PyCharm (located at the bottom of the IDE) and install the python package.
- NumPy: pip install numpy (PyPI, 2024)
- Werkzeug: pip install Werkzeug (PyPI, 2024)
- OpenCV: pip install opency-python (PyPI, 2024)
- Flask: pip install Flask (PyPI, 2024)

Step 6: Create the directory structure as shown in figure 1.

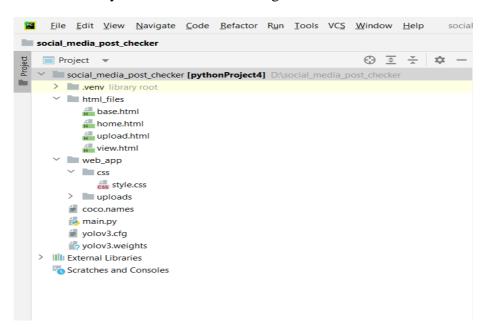


Figure 1: Directory and files structure of project.

- Main.py Main Python script containing Flask application code.
- html_files: Contains HTML templates for rendering web pages.
 - o upload.html: This is the page where users can upload an image along with a caption. It includes a form that allows users to submit their posts. If a potential threat is detected in the image or text, a confirmation modal will appear asking the user to confirm their upload.
 - o view.html: This page displays a gallery of uploaded images along with their captions. Images with detected threats are highlighted with a red border.

- Web_app: It holds CSS and upload files.
 - o style.css: This CSS file provides custom styling for the web pages.
 - o uploads: This folder will be used to store uploaded images and captions.
- Move or copy files to the root directory of your project (where main.py is located).

Step 8: Download the project files as a ZIP

Extract the zip file and paste each file and code has structured above.

4 Running the Application

- In the top-right corner of PyCharm, select the configuration you created.
- Click the green Run button

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  style.css × 🚜 base.html × 🚜 home.html × 🚜 upload.html × 🚜 view.html ×
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          from flask import Flask, render_template, request, redirect, url_for, flash, jsonify, send_from_directory
           import numpy as np
import cv2
           from datetime import datetime
           from werkzeug.utils import secure_filename
          import secrets
          app = Flask(__name__, template_folder='html_files')
app.config['UPLOAD_FOLDER'] = 'web_app/uploads'
           app.config['SECRET_KEY'] = secrets.token_hex(24) # Securely generated an secret key
          if not os.path.exists(app.config['UPLOAD_FOLDER']):
               os.makedirs(app.config['UPLOAD_FOLDER'])
          yolo_weights_path = 'yolov3.weights
           yolo_config_path = 'yolov3.cfg
           net = cv2.dnn.readNet(yolo_weights_path, yolo_config_path)
          layer_names = net.getLayerNames()
output_layers = [layer_names[ - 1] for i in net.getUnconnectedOutLayers()]
          with open(yolo_names_path, "r") as f:
    classes = [line.strip() for line in f.readlines()]
```

Figure 2: The PyCharm interface shows the green play button used to start the application.

The application will start and be accessible at http://127.0.0.1:5000/.

Figure 3: shows the http://127.0.0.1:5000/ to access the web application.

5 Accessing the Web application

- Open your web browser and navigate to http://127.0.0.1:5000/ to access the web application.
- On the upload page you will see the upload page where you can submit your posts with an image and caption.

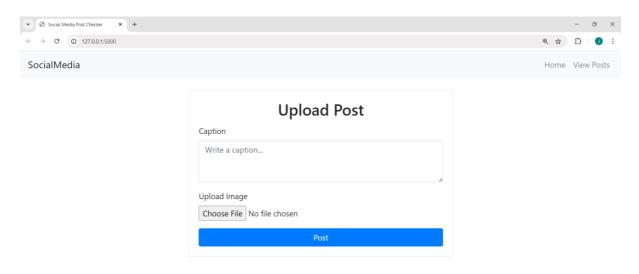


Figure 4: The upload page of web application.

• On the view posts page after uploading, you can view your posts on the view page.

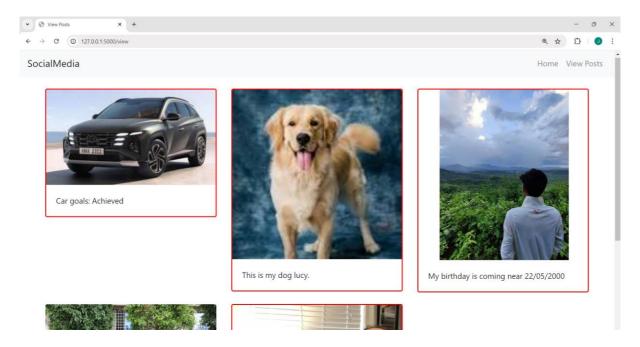


Figure 5: The view posts page displays your uploaded posts.

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