Configuration Manual

MSc Research Project
MS in Cyber Security

Goutham Tattur Nagaraja
Student ID: 19237243

School of Computing
National College of Ireland

Supervisor: Dr. Vanessa Ayala-Rivera

Student Name:	Goutham Tattur Nagaraja
Student ID:	19237243
Programme:	MS in Cyber Security **Year:** 2021
Module:	Research Project
Lecturer:	Dr. Vanessa Ayala-Rivera
Submission Due Date:	16/12/2021
Project Title:	A framework to prevent insider threats by mitigating lunch time attacks using biometrics
Word Count:	503 **Page Count: 4**

Signature:	Goutham Tattur Nagaraja
Date:	16/12/2021

PLEASE READ THE FOLLOWING INSTRUCTIONS AND CHECKLIST

Office Use Only	
Signature:	
Date:	
Penalty Applied (if applicable):	

Configuration Manual: A framework to prevent insider threats by mitigating lunchtime attacks using biometrics

Goutham Tattur Nagaraja
19237243

1   Introduction

The documentation contains thorough information on the hardware and software requirements for executing this prototype. The information provided in this manual will assist in the replication of the research more practically. The user manual will help in user interaction with the developed research prototype.

2   Hardware Requirements

- Raspberry pi 4 64-bit quad-core Cortex-A72 processor and 2GB RAM
- 32 GB SD Card
- Fingerprint Scanner - TTL (GT-521F32)
- Pi camera

3   Software Requirements

- Raspberry Pi OS
- Python 3.7.4
- Putty
- VNC viewer
- Advanced IP scanner

4 Libraries Required

Serial 2.7	import serial
Tkinter 8.5	import tkinter
Imutils 0.5.4	from imutils.video import VideoStream
Keras 2.7.0	from keras.preprocessing.image import img_to_array
Keras 2.7.0	from keras.models import load_model
Numpy 1.22.1	import numpy as np
Imutils 0.5.4	import imutils
Pickle 0.0.1	import pickle
Opencv 1.0.1	import cv2

4.1 Serial 2.7

Access to the serial ports is performed by the Serial module. The backend for Python across all platforms is provided by Serial libraries (PySerial, 2021). The prototype is built on a Linux platform hence the use of a serial library. This library automatically selects the appropriate backend.

4.2 Tkinter 8.5

This library is the Python interface to the GUI toolkit (python, 2021). The `tkinter` libraries are available on various platforms such as Unix, Windows systems, MacOS etc.

```
1    import tkinter as tk
2    from tkinter import *
```

4.3 Imutils 0.5.4

This is a set of OpenCV convenience functions for doing simple image processing tasks including translation, rotation, scaling, skeletonization, and presenting Matplotlib

pictures. (Github, 2021). This library is used for calibrating facial recognition using OpenCV in the deployed model.

```
11    import imutils
21    from imutils import paths
26    from imutils.video import VideoStream
frame = imutils.resize(frame, height=480, width=640)
 image = imutils.resize(image, width=600)
```

4.4 Keras 2.7.0

Keras is a deep learning API written in Python that works on top of the TensorFlow machine learning framework. Deep learning is used to train the model to recognize different facial images.

```
18    from keras.preprocessing.image import ImageDataGenerator
19    from keras.optimizers import Adam
20    from keras.utils import np_utils
27    from keras.preprocessing.image import img_to_array
28    from keras.models import load_model
```

4.5 Numpy 1.22.1

This python library consists of multidimensional array objects and a set of functions for changing the array values. In this research deployment, Numpy is used to modify the array values.

4.6 Imutils 0.5.4

This library is a set of OpenCV functions for doing simple image processing tasks like translation, rotation, scaling, skeletonization, and presenting Matplotlib pictures.

4.7 Pickle 0.0.1

For Python object structures, this module supports binary serialization and de-serialization protocols. The process of transforming a Python object structure into a stream of bytes is known as pickling. (Python, 2021).

4.8 Opencv 1.0.1

This Python library is a large open-source library for image processing, machine learning, and computer vision. In the development, OpenCV is used to process images and videos of faces for facial recognition. It is integrated with Numpy which is a numerical operations package that is highly efficient. All operations performed with Numpy can be combined with OpenCV (geeksforgeeks, 2021).

5 References

geeksforgeeks. (2021, 12 10). *OpenCV Python Tutorial*. Retrieved from https://www.geeksforgeeks.org/: https://www.geeksforgeeks.org/opencv-python-tutorial/

Github. (2021, 12 09). *PyImageSearch*. Retrieved from github.com: https://github.com/PyImageSearch/imutils

PySerial. (2021, 12 10). *Welcome to pySerial's documentation*. Retrieved from pyserial.readthedocs.io: https://pyserial.readthedocs.io/en/latest/

Python. (2021, 12 08). *pickle — Python object serialization*. Retrieved from docs.python.org: https://docs.python.org/3/library/pickle.html

python. (2021, 12 10). *tkinter — Python interface to Tcl/Tk*. Retrieved from docs.python.org: https://docs.python.org/3/library/tkinter.html