National College of Ireland

Configuration Manual

Hiding Financial data in applications based on AES Encryption and Steganography Method

MSc Research Project
MSC in Cyber Security Evening-Year 2- MSCCYBE_JANOL23

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MSc Project Submission Sheet

School of Computing

Student Name:	Parwat Lohani
Student ID:	x22179232
Programme:	MSC in Cyber Security **Year:** 2023-2024
Module:	Academic Internship
Supervisor:	Michael Pantridge
Submission Due Date:	12th Aug 2024
Project Title:	Hiding Financial data in applications based on AES Encryption and Steganography Method
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I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.
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Signature: Parwat Lohani

Date: 12th Aug 2024

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Configuration Manual

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1 Introduction

The research project implementation requires various dependencies to be installed. These dependencies are

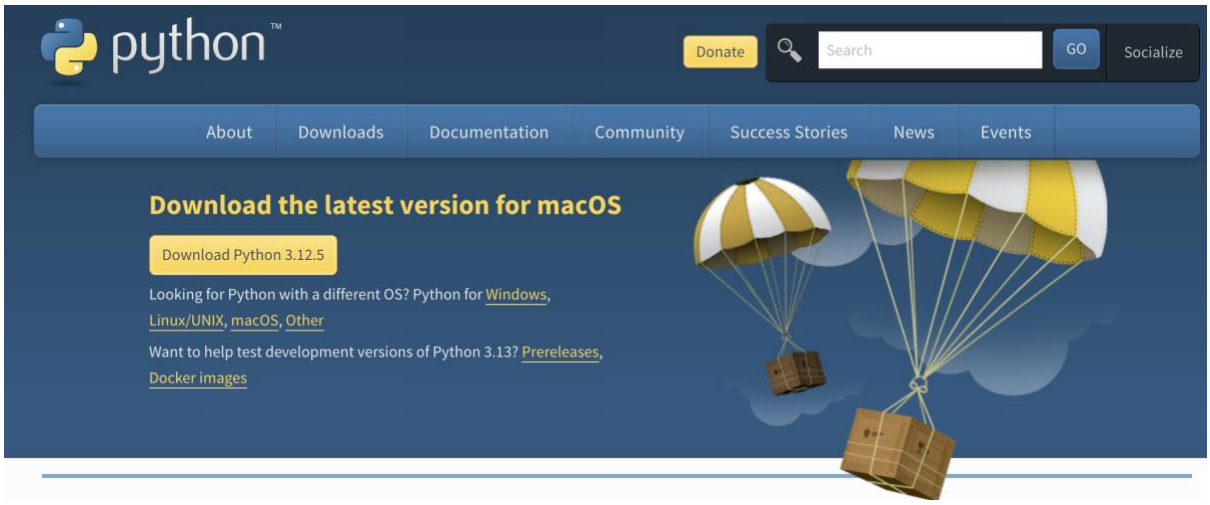
1. Python 3.1
2. MATLAB by Mathworks
3. Public Images data set for testing

Post installation of dependencies the next step is to execute the python and MatLabs scripts.

2 Python Lab Setup

Python[1] is an interpreted, object oriented, programming language that helps in integrating various systems and helps in Rapid Application Development. Python support various packages and modules to enable IDE to write system code.

Python Software Foundation (PSF) is the organization behind Python
URL = https://www.python.org/
Current Release = Python 3.12.5 for MacOs



Once Python is installed, please open the IDE and execute various Python libraries.

1. Pip install cryptography – to install crypto libraries
2. Pip install –upgrade pip
3. Pip install scipy - to install image manipulation & processing
4. Pip install pillow – to install image related library

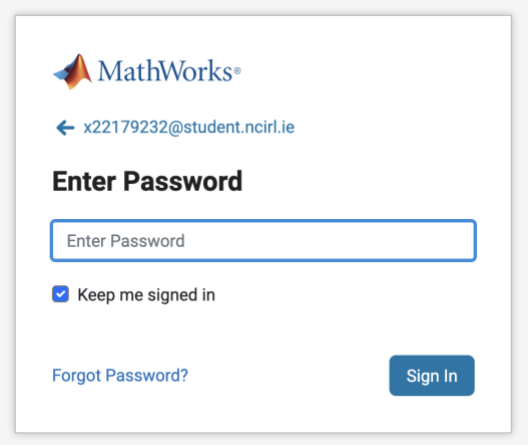
5. Pip install numpy
6. Pip install opencv-python – to install open source computer vision library

3 MatLab Installation

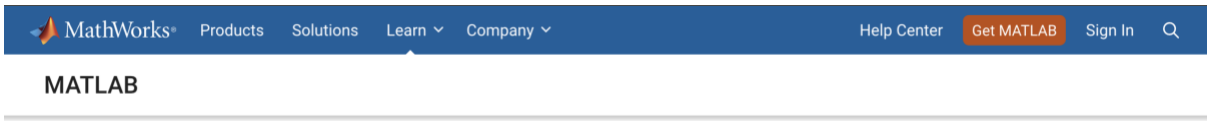
MATLAB [2] is a proprietary multi-paradigm programming language and numeric computing environment developed by MathWorks. MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages.

URL = https://in.mathworks.com/discovery/what-is-matlab.html
Current Release = MATLAB_2024a

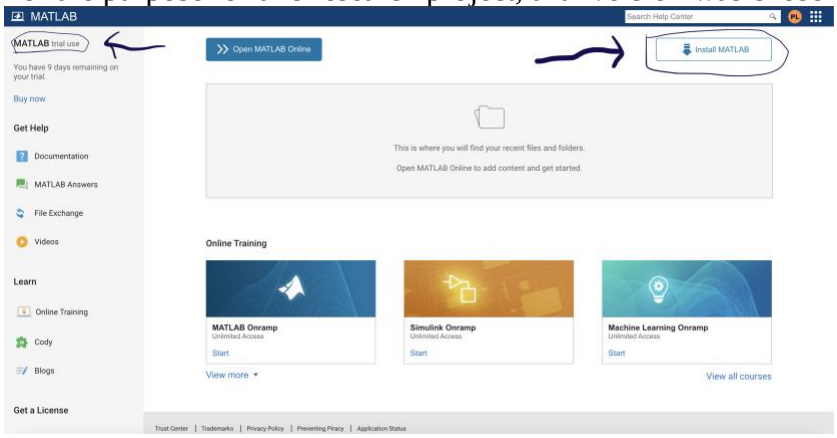
Click on “Sign in” first. Create a new account or signing with existing account



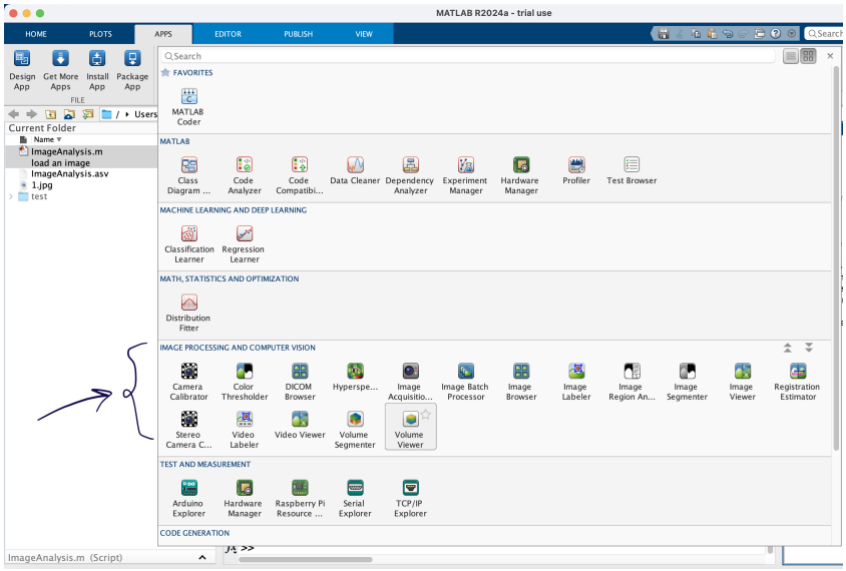
Click on the “GetMATLAB”



For the purpose for this research project, trial version was chosen.



Install packages and libraries related to image manipulation and processing



4 Public Images Data Set

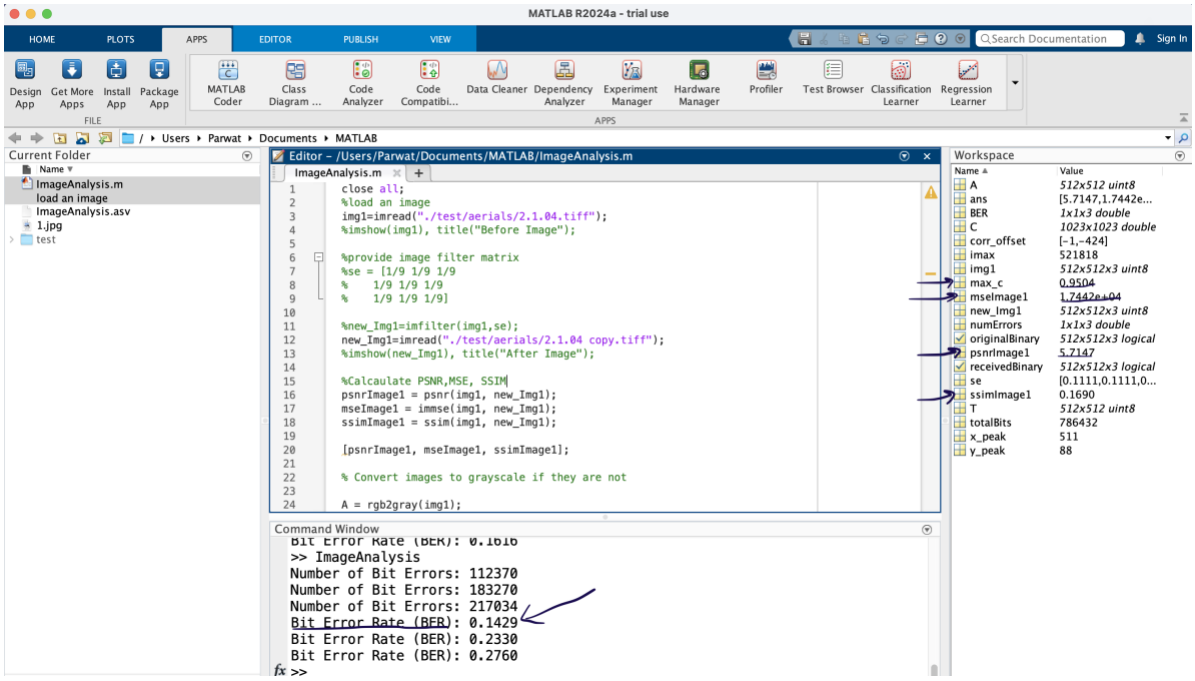
The USC-SIPI [4] Image Database is a collection of digitized images primarily maintained to support research in image processing, image analysis, and machine vision. The initial edition of this database was released in 1977, and since then, numerous new images have been added.

Click on “Textures” and “Aerials” link to download the test images.

5 Execution of scripts

There are 4 files which are required to execute to capture the test results. The files are

1. Encryptthedata.py – it is Python script, which encrypt the input strings
2. Compression.py – it is a python script, having sample code base to do compression
3. Hideimagedata.py – it is a python script, which embed payload from 10K bytes to 80K bytes in .tiff images
4. ImageAnalysis.m – MATLAB file, which compares images a.k.a original and stageno image and provide PSNR, MSE, NCC, BER per image basis. These data values are used for further analysis.



References

[1] https://www.python.org/doc/essays/blurb/

[2] https://in.mathworks.com/discovery/what-is-matlab.html

[3] https://sipi.usc.edu/database/