

Enhancing Encryption in Cloud Computing
and Reducing Energy Usage by Using
PSO-ALO Algorithm to Improve
Homomorphic Encryption Technique -
Configuration Manual

MSc Research Project
Cloud Computing

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Enhancing Encryption in Cloud Computing and Reducing Energy Usage by Using PSO-ALO Algorithm to Improve Homomorphic Encryption Technique - Configuration Manual

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1 Introduction

This setup manual/handbook describes the procedure for replicating the implementation of an optimized encryption method. It also includes the general setup for establishing the research's required tools. The primary aim of this document is to provide the information and instructions needed to run the code that was supplied as a part of the research thesis submission. The C programming language is used to code the entire project.

2 Pre-requisites

The user should have basic understanding of programming languages and should be well versed with the functioning of the Matlab tool. Moreover, the user system should have or install a Matlab version of R2016a or greater.

3 Environment

3.1 Hardware Specifications

- Operating System: Windows 10 Home Single Language
- Processor: AMD Ryzen 7 5800H
- Installed Memory (RAM): 16 GB
- System type: 64-bit Operating System
- Storage Capacity: 1 TB Hard Disk

4 Minimum System Requirements

The minimum requirements required to replicate the implemented research are as follows:

- Memory required (RAM) : Minimum 8 GB of RAM required.

- Operating System : Windows 10 or higher version.
- Disk Space : Atleast 40 GB of free space required.

5 Matlab Installation

1. So the first step is to navigate to <https://uk.mathworks.com/> for downloading Matlab simulation tool. The figure 1 shows the MathWorks official website.

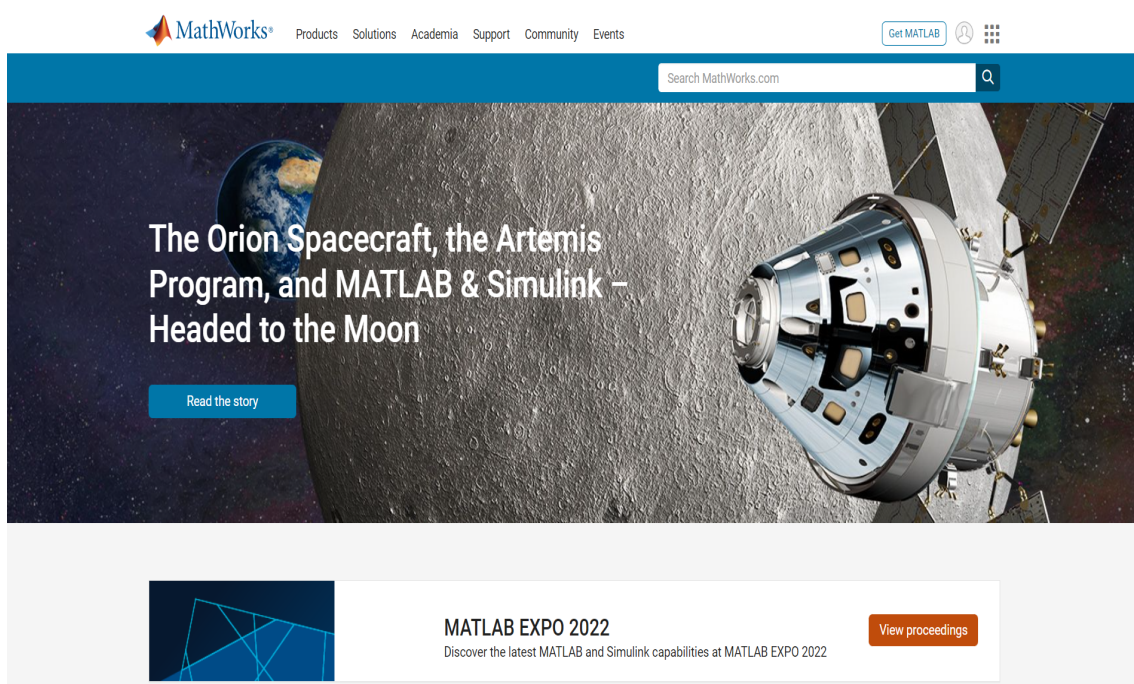


Figure 1: Mathworks Official Website for MATLAB Simulation Tool

2. Before installation of Matlab you will need to create an account on Mathworks.com as shown in figure 2, you'll need to complete the steps to install Matlab on your system.

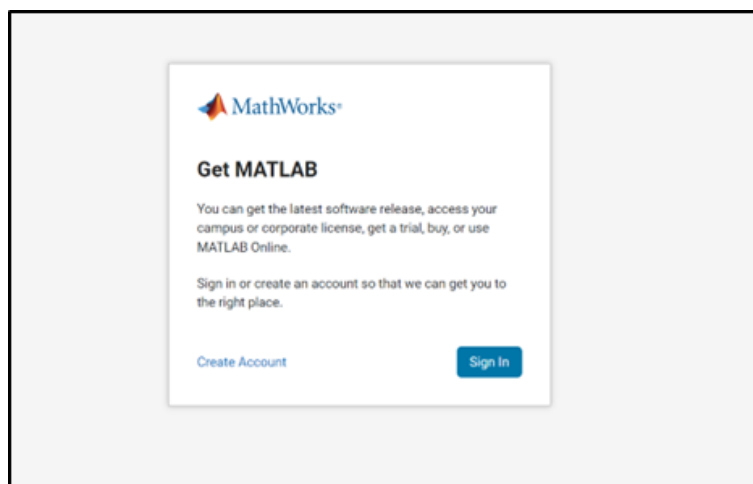


Figure 2: Creation of a MathWorks account

3. As seen in figure 3, you'll have to enter your organizational email, set a password and then verify your mail-id.

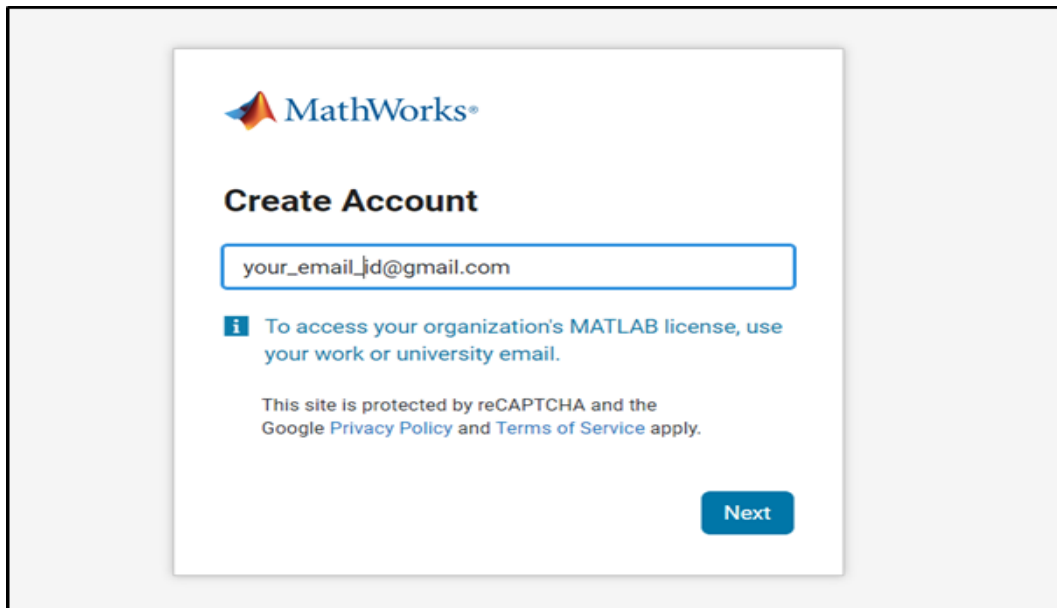


Figure 3: Entering your organizational email

4. Once you create your Mathworks account you'll be redirected to the Mathworks dashboard as seen in figure 4. Now as we need to install MATLAB, we'll click on get a free trial tab. I have utilized the student account as free trial of 30 days provided to student accounts. However, if you have a license you can proceed ahead with a licensed version as well.

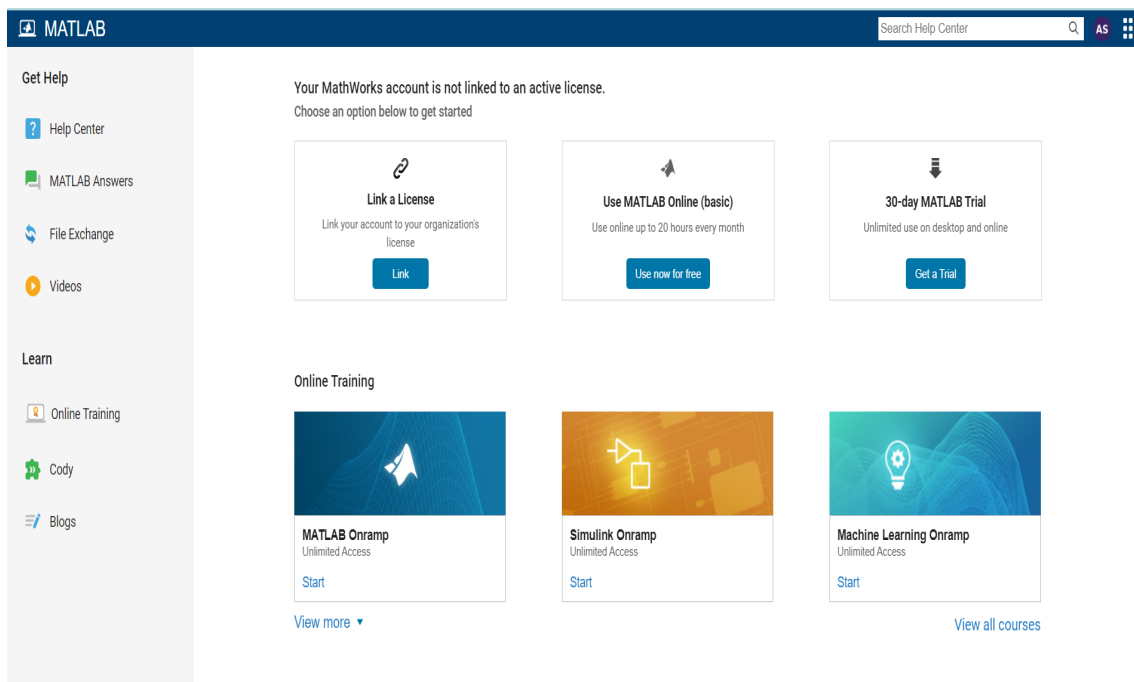


Figure 4: MathWorks Dashboard

6 Importing Code files in Matlab

The following section provides with an overview of how to download and execute the code to replicate the submitted research.

- Now as the Matlab is successfully installed, in order to replicate the working of the research project the user will have to download and extract the "x21127409_CodeArtifact.zip" file which is submitted.

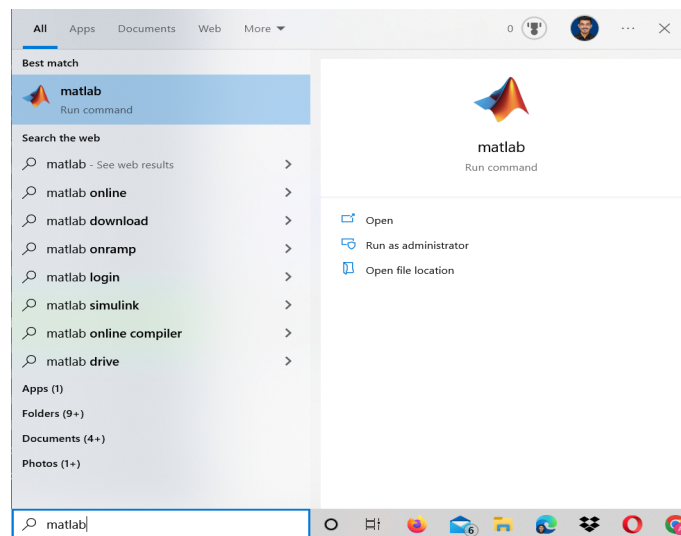


Figure 5: Running Matlab simulation tool

- As shown in the above figure 5, the first step is to copy the path of the directory where the code files are stored. Then to run the installed Matlab tool we need to navigate to windows searchbar and search "Matlab". Then click on the Matlab icon to execute the simulation software.
- Once we run the Matlab simulation tool will boot up and the following Matlab window will pop up as shown in figure 6.

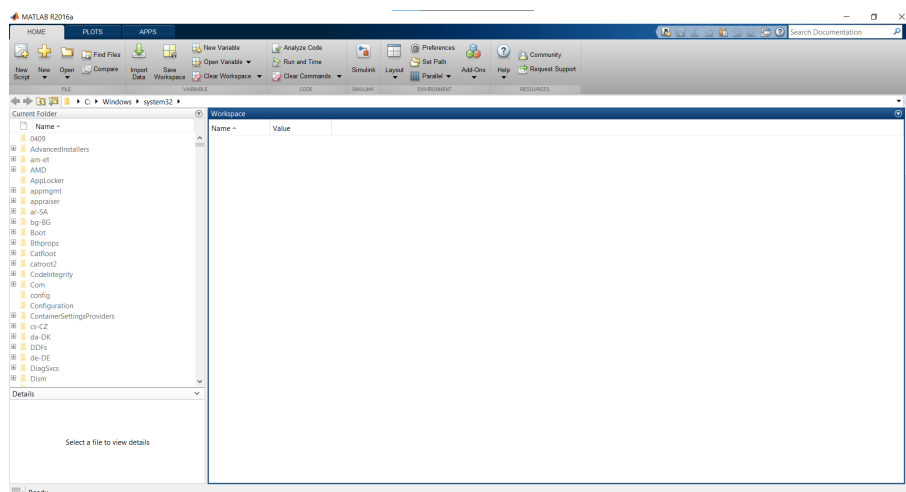


Figure 6: Matlab Tool

- Now to open the code directory within Matlab paste the copied code directory's path in Matlab's file navigator bar and press enter as shown in figure 7. In our scenario the code repository path was D:\x21127409_CodeRepository\Code.

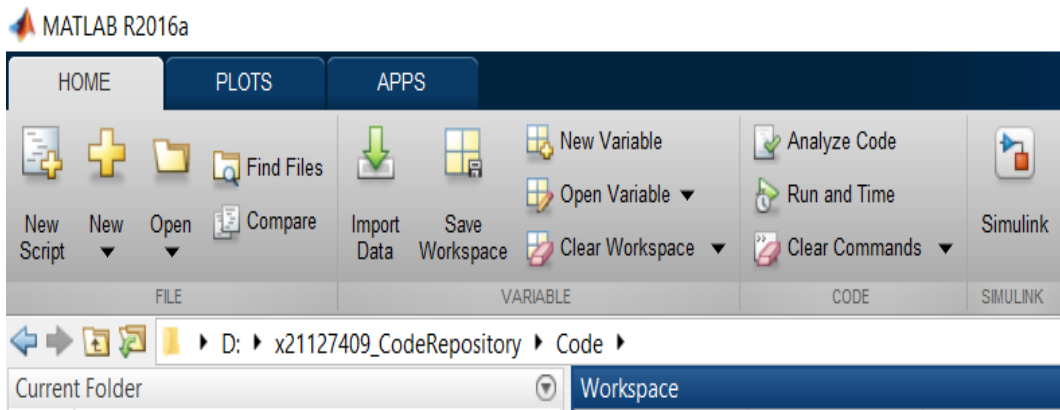


Figure 7: Pasting the code repository path

- So once the directory's path is pasted, all the code files are displayed in the current folder panel on the left hand side as seen in 8.

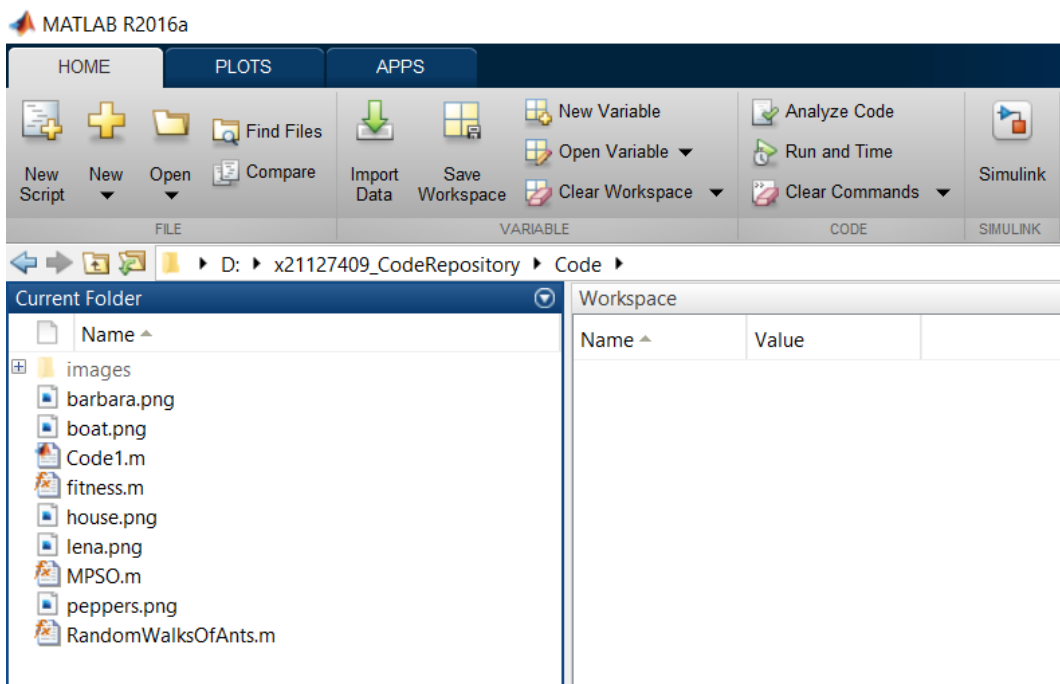


Figure 8: Imported code files in Matlab

7 Execution of the Matlab Code

- So, now as the code files are imported into Matlab we can run the code file to obtain the simulation results of the research. So now to execute, we simply need to select the "Code1.m file" and press right click on the file. Then we need to select the "Run" option from the drop-down list to execute the code as shown in figure 9.

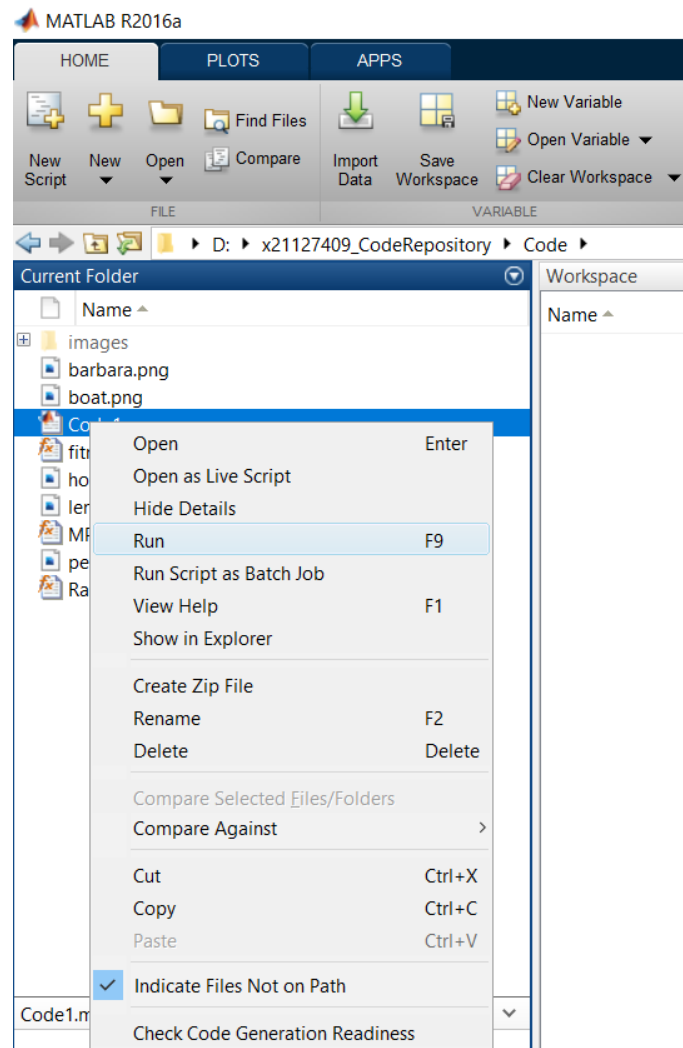


Figure 9: Executing the Code

After running the "Code1.m" file the execution will start and later the simulation results will be obtained. Further, comparison will be made with the help of graph between the existing approach and the proposed approach.

References

Install products (n.d.).

URL: <https://uk.mathworks.com/help/install/install-products.html>

W3Schools free online web tutorials (n.d.).

URL: <https://www.w3schools.com/>