VISHWAKARMA INSTITUE OF TECHNOLOGY

DEPARTMENT OF ENGINEERING SCIENCES AND HUMANITIES

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| **EDAI 2 PROJECT BATCH No:- 2** | **EDAI 2 PROJECT GROUP No:- 7** | **ACADMIC YEAR 2022-23** | | **SEMESTER-2** |
| TITLE OF PROJECT | Systems and Methods: Image Encryption using XOR operations. | | | |
| DOMAIN | Security Systems | | | |
| TOOLS | Python, Pillow (PIL), NumPy. | | | |
| TECHNOLOGY | Image Processing | | | |
| NAME OF GUIDE | Prof. Priyanka Bhatele | | Roll Numbers: - 36, 37, 38, 39, 40, 41 | |

**SYNOPSIS**

**IMPORTANCE OF THE DECIDED PROJECT (2/3 LINES):-**

1. Image encryption and decryption are necessary techniques to preserve the confidentiality of personal photos otherwise they could be easily accessed by unauthorized users leading to privacy violations.
2. At this time, almost all long-distance communications take place digitally. More than 1 billion images are shared every day digitally. Thus, the protection of images containing private or sensitive data is a must.
3. In the sectors of medicine and business, image encryption holds much-needed importance to save medical records or business documents from being accessed leading to identity theft or financial loss.

**STEPS TO DO THE PROJECT/ METHODOLGY (7/8 LINES): -**

1. The image is loaded into a multi-dimensional NumPy array using any of the libraries such as PIL or OpenCV.
2. The image is divided into smaller parts and these parts are processed individually.
3. The encryption algorithm and secret key are devised and applied to encrypt the parts of images using XOR and other encryption methods.
4. The encrypted parts are saved in a file or database.
5. The encrypted parts are then again loaded to a NumPy multi-dimensional array to process and decrypt the image.
6. The decrypted algorithm is devised and applied to the parts of the image using the same secret key.
7. The decrypted parts are then combined and the results are stored in a file or database.

T**ENTATIVE EXPECTED RESULTS FROM THE PROJECT (2/3 LINES):-**

1. Complex Image Encryption would be possible.
2. Decrypted images for access by authorized parties are expected.
3. Protection of Images from unauthorized users is thus possible.