Image Security using Image Encryption and Image Stitching

Fidha Asharaf
Roll No: 23
Reg.No: KTE22MCA-2023

Guided By
Prof. Jincy Kuriakose
Department of Computer Applications
Rajiv Gandhi Institute Of Technology, Kottayam

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Introduction

- With the rise of multimedia applications and digital communication, securing digital images becomes crucial.
- Current network security measures are inadequate against escalating cyber threats.
- This proposed method utilizes AES encryption on split images based on linear homogeneity, followed by decryption and image stitching.

Current state of art

- Conventional encryption methods lacked the ability to provide double security measures.
- Existing encryption methods lacked robustness against sophisticated attacks, compromising the confidentiality of transmitted images.
- The existing system used basic AES encryption for image security, lacking advanced image splitting and stitching based on homogeneity.

Motivation

- Growing digital communication demands robust security systems for safeguarding data against cyber threats.
- Conventional encryption methods struggle with securing large image datasets, necessitating tailored techniques for image encryption.
- Integration of image encryption and stitching offers dual-layered protection, enhancing data security during transmission.

Objectives

- Provide double layered security.
- Develop an integrated system comprising admin and staff modules for seamless image sharing within the organization.
- Partition images based on linear homogeneity before encryption to enhance security against unauthorized access.
- Enable efficient decryption of shared files upon recipient's key request, followed by automated image stitching based on pixel count homogeneity.

Literature survey

Sl No.	Title	Author	Methodology	Limitations
1	Image stitching algorithm research based on OpenCV	Kaili Chen; Meiling Wang	Harris corner detection, NCC matching, RANSAC, cylindrical projection, and weighted fusion for efficient high-resolution image stitching.	- High computational costs - Poor matching accuracy - sensitivity to noise of the traditional Harris corner algorithm
2	A technical analysis of image stitching algorithm using different corner detection methods	Pranoti Kale, K.R.Singh	Compare Harris corner detection and SIFT algorithms for image stitching using similarity matrix matching.	- Limited discussion on computational complexity. - Comparison with other algorithms lacking. - Impact of noise, lighting, and environment not addressed.
3	Image encryption based on Advanced Encryption Standard (AES)	Saleha Saudagar; Mukund Kulkarni	Java-based software utilizing the AES Rijndael Algorithm to encrypt images	- Limited scalability - Compatibility not evaluated. - Security vulnerabilities not discussed.
4	Image encryption and analysis using dynamic AES	Amandeep Singh; Praveen Agarwal	Dynamic AES employs key-dependent dynamic S-Box	- Limited real-world analysis. - Robustness against attacks unclear. - Focus mainly on specific image types.

Table: Literature survey (Part 1)

Proposed Methodology

The proposed method includes several key stages.

- Partitioning of images.
- Implementation of AES algorithm
- Encrypted images saved to local files
- Files decryption
- Stitching images based on homogeniety

Architecture

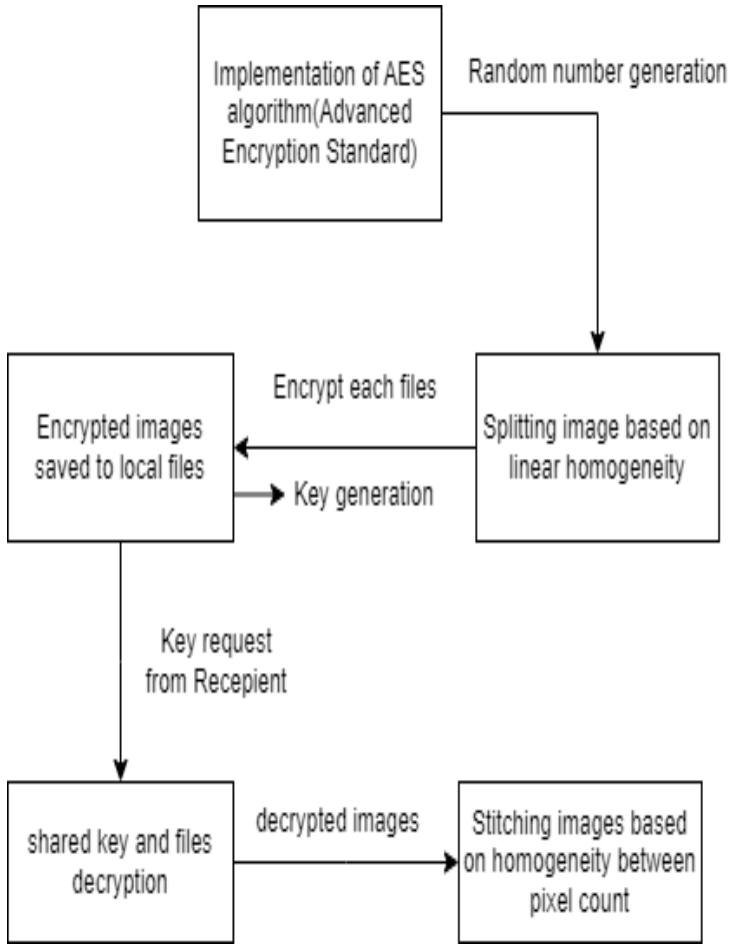

Figure: Architecture

Implementation Status and Plan

Table: Implementation Status and Plan

Task	**Status**	**Remarks**
User Interface	completed	
Image partitioning	completed	
Image encryption	in progess	Planning to complete by March 4th 2024
Image decryption	yet to start	Planning to complete by March 15th 2024
Image stitching	yet to start	Planning to complete by April 15th 2024

Thank you!