University of Regina

Department of Computer Science

Winter 2019

CS 834 - Fundamentals of Computer Systems Security

Plan of the Project

Computer Forensics with Image Processing and Steganography

Submitted to Dr. Habib Louafi

By

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Regina, February 5, 2019

Introduction

Nowadays, computer crimes such as computer virus, networking intrusion, networking cheating and facial recognition disguises have been quite rampant, computer forensics play an extremely significant role in combating these illegal activities. The main purpose of computer forensics is to provide the court with traces of criminals in computers as valid evidences to bring these suspects to justice.

Among the numerous branches of computer forensics, we place our focus on image forensics for detailed research as well as image processing and steganography. Image processing can detect fraudulent images by analyzing pixel values and steganography involves hiding information (which could include files, pictures or messages etc.) in other pictures or even videos and making them into different fragments for security. In addition, deep learning is a trending new, hot topic now so we will also include deep learning in image forensics.

The structure of the whole project wi`ll be divided into three main parts: the concept of computer forensics, image processing in computer forensics and steganography in computer forensics. Image processing and steganography are all related to image forensics. Generally, we choose computer forensics as the main topic and further do two detailed researches in image forensics.

Our plan firstly involves doing some general survey to understand the framework of computer forensics. Secondly, we will select some papers to compare their main contents, extract useful parts to analyze and write research reports. Last, we will add our own creative ideas for computer forensics and write down our innovative methods while comparing them with existing works of other researchers. In addition, if possible, we would like to do some practical implementations both for image processing and steganography in computer forensics.

Outline of the project

These are the important points we are planning to cover in our project:

- Presentation for the project
- Introduction to computer forensics
- Process of computer forensics
- Computer forensics software
- Image processing in computer forensics
    - Introduction to image forensics
    - Types of image forensics
    - Implementation of image processing
        - Basic idea of image processing
        - Image disguise
        - Image detection
        - Demo
    - Deep learning in image forensics
        - Camera source forensics
        - Median filter forensics
        - Recapture forensics
- Steganography
    - Background
    - Digital massages
    - Applications
    - Implementation
        - Modify data
        - Encryption and hide
        - Carrier
        - Coding
- Conclusion

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