# Image Authentication and Steganalysis System in Abstract

This project addresses the ever-increasing problem of image tampering. The tampering addressed could take on two forms: steganography and simple image alterations. Hence the project has a two-fold objective: steganalysis and image authentication. In the first part of the project, we deal with the steganalysis of Least Significant Bit (LSB) embedding for hiding messages in digital images in the BMP format. We will implement a steganalytic technique that enables us to reliably detect the presence of binary message randomly spread in a digital image. The method is based on close color pair analysis. It is our goal that it will be possible to achieve a high degree of detection reliability.

In the second part of the project we deal with the issue of detection of image tampering i.e. image authentication. Two approaches are adopted for image authentication. The first approach deals with the authentication of BMP images. The method used for that is by deriving and embedding a digital signature in the image. If time permits, a second approach that deals with the authentication of JPEG images will be implemented. A data embedding method is proposed for image authentication based on table look-up in the frequency domain. A watermark is embedded invisibly in the marked image which can be stored in the compressed form. The scheme can detect and localize alteration of the original image. We also propose a technique for self-embedding an image into itself as a means for protecting the image content. The original image and extracted embedded image are visibly compared by a human observer for possible differences.

The proposed methodologies are characterized as blind fragile and semi-fragile authentication techniques respectively, since they do not rely on the original image to decade whether the image has been altered or not.