Visible Display Hiding Process Using Natural Plant Extracts Filters

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***Abstract*— New leaf extract filters for colour image processing are introduced and analysed in this paper. The proposed methodology constitutes unifying and powerful bio-chemicals to DISPLAY HIDING TECHNIQUES. Using the proposed methodology, colour image hiding techniques are treated from a global viewpoint that readily yields and unifies previous, seemingly unrelated, results. The new leaf extracts filters can absorb all colors of local data in the color DISPLAY. The principles behind the new filters are explained in detail. Simulation studies indicate that the new METHOD are computationally attractive and have excellent performance.**

I. INTRODUCTION

Color Image Hiding Process has been the subject of extensive research during the last ten years. The amount of research published to date indicates a great interest in the areas of color image hiding and analysis. It is widely accepted that color conveys information about the objects in a scene and that this information can be used to further refine the performance of an imaging system [4]. Color image hiding techniques [1] are studied in this paper using a natural approach. The value of polarized light decreased at each image pixel with leaf extracts. These proposed plant leaf had excellent anti-polarized properties, which are useful to hide polarized light in display units. In particular, the most important processing tasks are image hiding with leaf extract s[1], since these are new technology of any image processing system, consider the following commonly used model for a color image polarized light[2]:

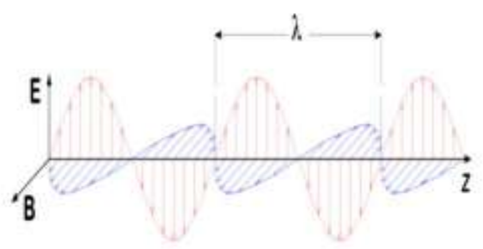

Fig. 1 A model for color image polarized light

The basic concept of polarization focuses on Electromagnetic waves, such as light travelling in free space or another homogeneous isotropic non-attenuating medium, are properly described as transverse waves, meaning that a plane wave's electric field vector **E** and magnetic field **H** are in directions perpendicular to (or "transverse" to) the direction of wave propagation; **E** and **H** are also perpendicular to each other. Considering a monochromatic plane wave of optical frequency *f* (light of vacuum wavelength *λ* has a frequency of $f = c/\lambda$ where *c* is the speed of light), let us take the direction of propagation as the *z* axis. Being a transverse wave the **E** and **H** fields must then contain components only in the *x* and *y* directions whereas $Ez=Hz=0$. Using complex (or phasor) notation, we understand the instantaneous physical electric and magnetic fields to be given by the real parts of the complex quantities occurring in the following equations. As a function of time *t* and spatial position *z* (since for a plane wave in the +*z* direction the fields have no dependence on *x* or *y*) [6] these complex fields can be written as:

$$\vec{E}(z,t) = \begin{bmatrix} e_x \\ e_y \\ 0 \end{bmatrix} e^{i2\pi(z/(\lambda/n)-t/T)} = \begin{bmatrix} e_x \\ e_y \\ 0 \end{bmatrix} e^{i(kz-\omega t)}$$

$$\vec{H}(z,t) = \begin{bmatrix} h_x \\ h_y \\ 0 \end{bmatrix} e^{i2\pi(z/(\lambda/n)-t/T)} = \begin{bmatrix} h_x \\ h_y \\ 0 \end{bmatrix} e^{i(kz-\omega t)}$$

where λ/*n* is the wavelength *in the medium* (whose refractive index is *n*) and $T = 1/f$ is the period of the wave. Here *ex*, *ey*, *hx*, and *hy* are complex numbers. In the second more compact form, as these equations are customarily expressed, these factors are described using the wave number = 2 / and angular frequency (or "radian frequency") = 2 [2]. In a more general formulation with propagation *not* restricted to the +*z* direction, then the spatial dependence is replaced by

˜ . where ˜ is called the wave vector, the magnitude of which is the wave number. This wave number can be modified by using anti polarized elements which can absorb intensity of polarized light in all LCD type displays. These plant properties can be absorb by polarized light propagation = 2 / .

In this paper polarized filtering techniques have been proposed to hide display. Specifically, nonlinear filters applied to color images have been designed to preserve edges and details, and remove impulsive and visible intensity. It has been recognized by many researchers that vector processing of color images is probably a more effective way (as compared to scalar) to filter out polarized light and to enhance hiding intensity of display[1]. The leaf properties of shiny spinach (juice) can act as anti-polarized filter[1] of display units. In this process the display units will not project any images through this leaf juice layer [1].

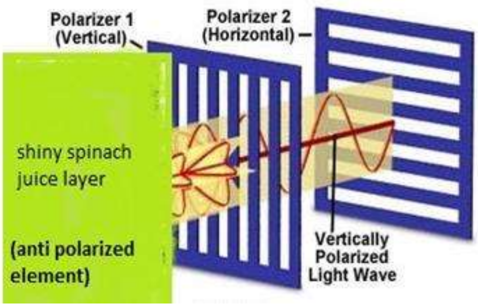

Fig.2 Light passing through crossed polarizer's

This shiny spinach juice layer can absorb the visible polarized light in LCD type display devices. Initially light passes through vertical and horizontal polarized layers of that passes through this juice layer. Then visible intensity absorbed by this new layer and displays only white light color display appeared on the display[1].

Fig.3 Display when coated with a spinach juice layer

This new technique will provide an excellent security for image processing applications.

Basic concept of this process is related to LCD displays. A liquid crystal display (LCD) depends on liquid crystals which can rotate the polarization axis of light as it passes through. Here's how an LCD display works. An LCD pixel is made up of numerous layers, but must include a pair of linear polarizer's and a thickness of nematic liquid crystal with transparent electrodes that can apply a voltage across the liquid crystal. Shiny spinach juice can absorb polarized light on LCD monitors[2] and which can visible with polarized film.

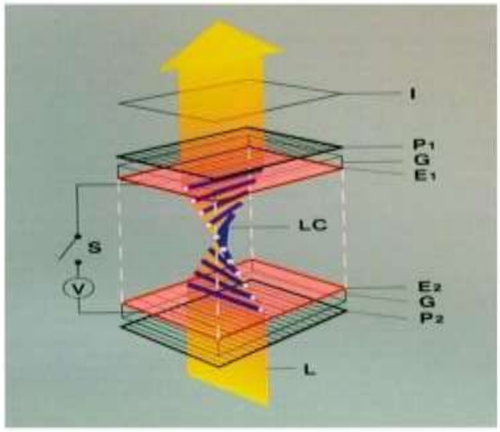

Fig.4 Light passing through crossed polarizer's

In above figure, **I** indicates simple mirror with a transparent glass, this can protect inners layers of the display. **P1, P2** layers filter the light vertically and horizontally. **E1** layer increases light intensity of first polarized light. **E2** generate basic level of light which can pass through different layers of LCD display. **LC** denotes electro-magnetic vibrations between two edge layers **E1,E2[4]**. This process explains general principles of LCD displays.

In this paper a new plant leaf is introduced for hiding the display in LCD displays. This plant leaf juice had polarized light absorption properties[1]. Following picture indicates shiny spinach juice coated layer principle. This layer is designed for light absorbing process and can hide display with shiny spinach juice layer on it. It can absorb light of polarized and this absorbed light can visible with only two layer polarized film[2].

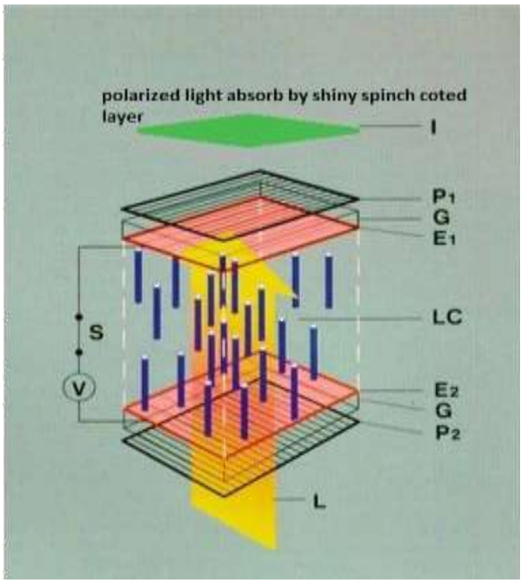

Fig.4 Image showing Polarized light absorb by shiny Spinach coated layer

The above picture shows shiny spinach coated layer. After this layer the light will be blocked[1] and display only white colored light. This blocked light can be made visible only through two layered polarized film.

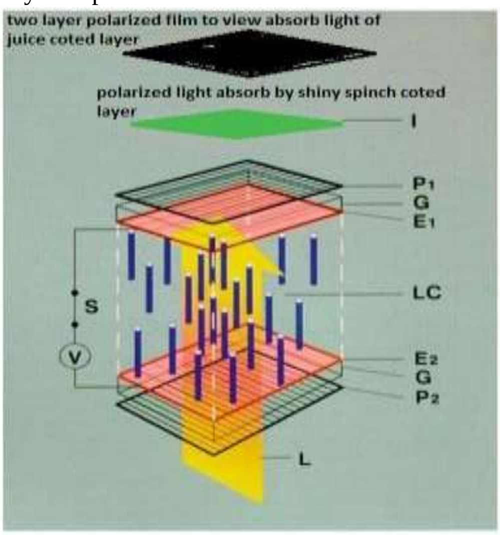

Fig.5 Image showing two layer polarized film to view absorb light of juice coated layer

In above figure, black layer (two layer polarized film) can show blocked light of shiny spinach juice layer and this blocked light can be visible only with two layer polarized film[2]. This application can give non-linear security to unstable display units.

II. CONCLUSIONS

This paper has introduced new method for display hiding elements to block color display data. These filters utilize display hiding techniques and nonparametric methodologies to adapt to display data. The behaviour of the leaf extracts filters is analysed and their performance is compared with that of the most commonly used non adaptive filters. Simulation results subjective evaluation of the filtered display indicates that the adaptive filters outperform all the other filters under the consideration. Moreover, as seen from the attached images, the adaptive filters preserve the chromaticity component, which is very important in the visual perception of color.

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