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Fuzzy S-Transform is used for Identifying Image Borders of the Medial Model Mycosic Fungoides

Suha I. S. Al-Ali
Department of Mathematic, College of Computer Science and Mathematical, Tikrit University, Tikrit, Iraq
suhaibrahim3@tu.edu.iq

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Abstract

In order to identify mycosis fungoides in medical photos, the researchers used an algorithm. There are several procedures that the detection system needs to take in order to identify cell mycosis fungoides. Mycosis fungoides image features have been studied using the new fuzzy transform because of the function's significance in accurate stage analysis. The statistical properties that were taken into consideration were energy, homogeneity, contrast, correlation, median, mean, entropy, and homogeneity. It has been confirmed that these statistical traits may be used to differentiate across various mycosis fungoides time periods.. We relied on the persistence function since it provides more precise examination of affected regions. Orthogonal conversion was found to be effective in assessing pixel area without changing image properties, allowing for the diagnosis of various illness stages.

Keywords: Finite symmetric orthogonal fuzzy transform , Orthogonally relation, transform linear , images process , mycosic fungoides.

1. INTRODUCTION

Mycosis fungoides is a medical disorder that causes a rapid growth of aberrant cells. Because abnormal cells cannot do the same tasks as healthy cells and do not undergo the same maturation processes as normal cells, mycosis fungoides cannot operate normally [1].

According to current guidelines, doctors should approach patients who meet certain criteria with the idea of mycosis fungoides screening. Low-dose computed tomography (CT) is the recommended screening modality[2].

In the realm of mycosic fungoides diagnostics, computer assisted diagnosis (CAD) systems have been created as effective strategies for the identification and characterisation of diverse lesions[3].

In order to rapidly and reliably resolve real-world detection issues, several fields of study make use of arithmetic theories that depict mathematical models as a representation mathematics and information processing tool[4].

Structure of the Paper In Part 2, we will discuss the Orthogonal Fuzzy Transform.

The aforementioned strategy is described in Section 3.Environment evaluation per Section 4. Part 5: The Results of the Experiments, Section 6 draws its conclusions.

2.BASIC CONCEPTS

Definition 1 [6]:

A fuzzy number βin parametric form is a pair $\left(\underline{\beta},\overline{\beta}\right)$of functions $\underline{\beta}(\phi),\overline{\beta}(\phi)$, $0 \le \phi \le 1$, which satisfies the following requirements:

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1. $\underline{\beta}(\phi)$ is a bounded non-decreasing left continuous function in 0,1,and right continuous at0.
2. $\overline{\beta}(\phi)$ is a bounded non-increasing left continuous function in 0,1,and right continuous at 0.
3. $\underline{\beta}(\phi) \leq \overline{\beta}(\phi)$, $0 \leq \phi \leq 1$ .For $\beta = \underline{\beta}(\phi), \overline{\beta}(\phi)$and $\alpha = \underline{\alpha}(\phi), \overline{\alpha}(\phi)$and $\varphi > 0$we define addition$\beta \oplus \alpha$and subtraction $\beta \quad \alpha$ and scalar multiplication by $\varphi > 0$ as follows :

(a) Addition: $\beta \oplus \alpha = \underline{\beta}(\phi) + \underline{\alpha}(\vartheta), \overline{\beta}(\phi) + \overline{\alpha}(\phi)$

(b) Subtraction: $\beta \quad \alpha = \underline{\beta}(\phi) - \overline{\alpha}(\phi), \underline{\alpha}(\phi), \overline{\beta}(\phi) - \underline{\alpha}(\phi)$

(c) Scalar multiplication: $\varphi \odot \beta = \begin{Bmatrix} \left(\varphi\underline{\beta}, \varphi\overline{\beta}\right) & \varphi \geq 0 \\ \left(\varphi\overline{\beta}, \varphi\underline{\beta}\right) & \varphi < 0 \end{Bmatrix}$

Definition 3. [4]

Let $\varphi(\sigma): (a, b) \to E;$ constitute a significantly generalized differential difference at a continuous fuzzy-valued function σ_0 If an element is present, an aspect $\varphi^{\backslash}(\sigma_0) \in E$such that :

1- For all $\forall h > 0$sufficiently small$\exists\varphi(\sigma_0 + h) \quad \varphi(\varpi_0), \exists\varphi(\sigma_0) \quad \varphi(\sigma_0 - h)$ and the limit is

$$\varphi^{\backslash}(\sigma_0) = \lim_{h\to 0^+} \frac{\kappa(\sigma_0 + h)\varphi(\sigma_0)}{h} = \lim_{h\to 0^+} \frac{\varphi(\sigma_0)\varphi(\sigma_0 - h)}{h}$$

Or

2- For all $\forall h > 0$sufficiently small $\exists\varphi(\sigma_0) \quad \varphi(\sigma_0 + h), \exists\varphi(\sigma_0 - h) \quad \varphi(\sigma_0)$ and the limit is

$$\varphi^{\backslash}(\sigma_0) = \lim_{h\to 0^+} \frac{\varphi(\sigma_0)\kappa(\sigma_0 + h)}{-h} = \lim_{h\to 0^+} \frac{\varphi(\sigma_0 - h)\varphi(\sigma_0)}{-h}$$

Or

3- For all$h > 0$sufficiently small $\exists\varphi(\sigma_0 + h) \quad \varphi(\sigma_0), \exists\varphi(\sigma_0 - h) \quad \varphi(\sigma_0)$ and the limit is

$$\varphi^{\backslash}(\sigma_0) = \lim_{h\to 0^+} \frac{\varphi(\sigma_0 + h) \quad \varphi(\sigma_0)}{h} = \lim_{h\to 0^+} \frac{\varphi(\sigma_0 - h) \quad \varphi(\sigma_0)}{-h}$$

Or

4- For all$h > 0$sufficiently small $\exists\varphi(\sigma_0) \quad \varphi(\sigma_0 + h), \exists\varphi(\sigma_0 - h) \quad \varphi(\sigma_0)$ and the limit is

$$\varphi^{\backslash}(\sigma_0) = \lim_{h\to 0^+} \frac{\varphi(\sigma_0) \quad \varphi(\sigma_0 + h)}{-h} = \lim_{h\to 0^+} \frac{\varphi(\sigma_0 - h) \quad \varphi(\sigma_0)}{h}$$

Theorem 2 [3]: Let $\varphi: R \to E$ (E, or the collection of all fuzzy numbers, is symbolized by $\left[\underline{\varphi}(\sigma;\phi), \overline{\varphi}(\sigma;\phi)\right]$. Assume that for each given $\phi \in 0,1$ $\underline{\varphi}(\sigma;\phi)$and $\overline{\varphi}(\sigma;\phi)$are unctions that are Riemann-integrable on [a, b] for each b $\geq a$, Two beneficial functions exist. $\underline{M}_{\vartheta}$ and$\overline{M}_{\vartheta}$ such that$\int_a^b \left|\underline{\varphi}(\sigma;\phi)\right| \; d\sigma \leq \underline{M}_{\phi}$ and $\int_a^b |\overline{\varphi}(\sigma;\phi)| \; d\sigma \leq \overline{M_{\phi}}$,Then, $\varphi(\sigma)$is not Riemann−integrable on improper fuzzy $a, \infty)$ .Furthermore, we have: $\int_a^\infty \varphi(\sigma) \; d\sigma = \left[\int_a^\infty \underline{\varphi}(\sigma;\phi) \; d\sigma, \int_a^\infty \underline{\varphi}(\sigma;\phi) \; d\sigma\right]$.

Definition 4: Let $\varphi(\sigma)$ be a continuous fuzzy-valued function Suppose that $\varepsilon \int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\varphi(\sigma)d\sigma$is an improper fuzzy Riemann-integrable on $[0, \infty)$, then $\varepsilon \int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\varphi(\sigma)d\sigma$ is called $\hat{S}$-transform and is denoted as : $\hat{S}[\varphi(\sigma)] = \hat{S}(\varepsilon) = \varepsilon \int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\varphi(\sigma)d\sigma$ n ≥ 1

From Theorem 2 :

$$\varepsilon\int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\varphi(\sigma)d\sigma=\varepsilon\int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\underline{\varphi}(\sigma;\phi)d\sigma\,,\varepsilon\int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\overline{\varphi}(\sigma;\phi)d\sigma$$

Also by the definition of classic S-transform :

$$\hat{S}\left[\underline{\varphi}(\sigma;\phi)\right]=\varepsilon\int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\underline{\varphi}(\sigma;\phi)d\sigma\,,\widehat{S}[\overline{\varphi}(\sigma;\phi)]=\varepsilon\int_0^\infty e^{-(i\sqrt[a]{\varepsilon})\sigma}\overline{\varphi}(\sigma;\phi)d\sigma$$

So:

$\hat{S}[\varphi(\sigma;\phi)]=S\left[\underline{\varphi}(\sigma;\phi)\right],S[\overline{\varphi}(\sigma;\phi)].$

Theorem3 : Duality Between Fuzzy Laplace – $\widehat{\boldsymbol{S}}$transforms

If F(p) is fuzzy Laplace transform of $\varphi(\sigma)$ and $S(\varepsilon)$ is $\widehat{\boldsymbol{S}}$-transform of $\varphi(\sigma)$ then $\hat{S}(\varepsilon)=\varepsilon F\left(i\sqrt[a]{\varepsilon}\right)$ **.**

Theorem 4 : Let $\mathfrak{J}(\boldsymbol{\delta})$ by fuzzy function $\boldsymbol{\delta}\geq\mathbf{0},\ \boldsymbol{\eta}(\boldsymbol{\varepsilon})=\boldsymbol{\varepsilon},\boldsymbol{\varepsilon}\neq\mathbf{0}$ be positive real function and $\boldsymbol{\beta}(\boldsymbol{\varepsilon})=i\sqrt[a]{\varepsilon}\,,\boldsymbol{\varepsilon}\neq\mathbf{0}$ be positive complex function then the derivatives of $\mathfrak{J}(\boldsymbol{\delta})$ for nth- order will be as following :

1. $S\{\delta\,\mathfrak{J}(\delta)\}=-\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\mathfrak{J}(\delta),\varepsilon)}{\varepsilon}\right)'$

2.$S\{\delta^2\mathfrak{J}(\delta)\}=(-1)^2\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(\frac{1}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\mathfrak{J}(\delta),\varepsilon)}{\varepsilon}\right)'\right)'$

3.$S\{\delta^n\mathfrak{J}(\delta)\}=(-1)^n\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(\frac{1}{i\sqrt[a]{\varepsilon}}\left(\frac{1}{i\sqrt[a]{\varepsilon}}\left(\dots\left(\frac{1}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\mathfrak{J}(\delta),\varepsilon)}{\varepsilon}\right)'\right)'\right)'\right)'\dots\right)'$

Proof:

1. since $S\{\mathfrak{J}(\delta),\varepsilon\}=\varepsilon\int_0^\infty\underline{\mathfrak{J}}(\delta;\varepsilon)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta\,,\varepsilon\int_0^\infty\overline{\mathfrak{J}}(\delta;\varepsilon)e^{-(i\,i\sqrt[a]{\varepsilon})\delta}d\delta$

$\Rightarrow\frac{S\{\mathfrak{J}(\delta),\varepsilon\}}{\varepsilon}=\int_0^\infty\underline{\mathfrak{J}}(\delta;\varepsilon)e^{i\sqrt[a]{\varepsilon}\delta}d\delta\,,\varepsilon\int_0^\infty\overline{\mathfrak{J}}(\delta;\varepsilon)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta$

Derivative above equation with respect ε, **to get:**

$$\left(\frac{S\{\mathfrak{J}(\delta),\varepsilon\}}{\varepsilon}\right)'=\frac{d}{d\varepsilon}\left[\int_0^\infty\underline{\mathfrak{J}}(\delta;\varepsilon)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta\,,\int_0^\infty\overline{\mathfrak{J}}(\delta;\varepsilon)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta\right]$$

$$\left(\frac{S\{\mathfrak{J}(\delta),\varepsilon\}}{\varepsilon}\right)'=-\left(\sqrt[2n]{\varepsilon}+\varepsilon\right)\int_0^\infty\underline{\mathfrak{J}}(\delta;\varepsilon)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta\,,-\left(\sqrt[2n]{\varepsilon}+\varepsilon\right)\int_0^\infty\overline{\mathfrak{J}}(\delta;\varepsilon)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta$$

From equation (1), to get:

$$\left(\frac{S\{\mathfrak{J}(\delta),\varepsilon\}}{\varepsilon}\right)'=-\left(i\sqrt[a]{\varepsilon}\right)\frac{S\left\{\underline{\mathfrak{J}}(\delta;\varepsilon),\varepsilon\right\}}{\varepsilon},-\left(i\sqrt[a]{\varepsilon}\right)\frac{S\left\{\overline{\mathfrak{J}}(\delta;\varepsilon),\varepsilon\right\}}{\varepsilon}$$

$$\left(\frac{S(\mathfrak{J}(\delta),\varepsilon)}{\varepsilon}\right)'=-\left(i\sqrt[a]{\varepsilon}\right)\frac{S\{\delta\,\mathfrak{J}(\delta),\varepsilon\}}{\varepsilon}$$

Then, to get:

$$S\{\delta\,\mathfrak{J}(\delta)\}=-\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\mathfrak{J}(\delta),\varepsilon)}{\varepsilon}\right)'$$

2. since from the first part , we have :

$$S\{\delta\,\Im(\delta),\varepsilon\} = -\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\Im(\delta),\varepsilon)}{\varepsilon}\right)'$$

taking derivative for both sides of the above equation

$$-\left(i\sqrt[a]{\varepsilon}\right)\frac{1}{\varepsilon}\int_0^\infty \delta^2\underline{\Im}(\delta;\varepsilon)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta,$$

$$-\left(i\sqrt[a]{\varepsilon}\right)\int_0^\infty \delta^2\overline{\Im}(\delta;\varepsilon)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta = \left(-\frac{\varepsilon}{\left(i\sqrt[a]{\varepsilon}\right)}\left(\frac{S\{\Im(\delta),\varepsilon\}}{\varepsilon}\right)'\right)'$$

$$-\frac{\left(\sqrt[2n]{\varepsilon}+\varepsilon\right)}{\varepsilon}S\left\{\delta^2\underline{\Im}(\delta;\vartheta)\right\},\frac{\left(i\sqrt[a]{\varepsilon}\right)}{\varepsilon}S\left\{\delta^2\overline{\Im}(\delta;\vartheta)\right\} =$$

$$\left(-\frac{\varepsilon}{\left(i\sqrt[a]{\varepsilon}\right)}\left(\frac{S\{\Im(\delta),\varepsilon\}}{\varepsilon}\right)'\right)'$$

Thus :

$$S\{\delta^2\Im(\delta)\} = (-1)^2\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(-\frac{1}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\Im(\delta),\varepsilon)}{\varepsilon}\right)'\right)'$$

3. in similar way , we can prove the third part

$$S\{\delta^2\Im(\delta)\} = (-1)^2\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(-\frac{1}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\Im(\delta),\varepsilon)}{\varepsilon}\right)'\right)'$$

derivative both side of above equation (n-2)-Times, we get:

$$S\{\delta^n\Im(\delta)\} = (-1)^n\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\left(\frac{1}{i\sqrt[a]{\varepsilon}}\left(\frac{1}{i\sqrt[a]{\varepsilon}}\left(\ldots\left(\frac{1}{i\sqrt[a]{\varepsilon}}\left(\frac{S(\Im(\delta),\varepsilon)}{\varepsilon}\right)'\right)'\right)'\right)'\ldots\right)'$$

Theorem 5: Let $\boldsymbol{\eta(\varepsilon)=\varepsilon}$ and $\boldsymbol{\beta(\varepsilon)} = i\sqrt[a]{\varepsilon}$ are differentiable **functions such that** $\Im(\delta)$ be fuzzy function, then:

$$S\left\{\delta\Im^{(n)}(\delta)\right\} = -\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\frac{d}{d\varepsilon}\left(\frac{S\left(\Im^{(n)}(\delta)\right)}{\varepsilon}\right)$$

Proof:

Since $S\left\{\Im^{(n)}(\delta),\varepsilon\right\} = \varepsilon\int_0^\infty \underline{\Im}^{(n)}(\delta;\vartheta)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta\,,\varepsilon\int_0^\infty \overline{\Im}^{(n)}(\delta;\vartheta)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta$

$$\frac{S\{\Im^{(n)}(\delta),\varepsilon\}}{\varepsilon} = \int_0^\infty \underline{\Im}^{(n)}(\delta;\vartheta)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta\,,\int_0^\infty \overline{\Im}^{(n)}(\delta;\vartheta)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta \qquad (2)$$

By derivative above equation respect to ε, **then :**

$$\frac{d}{d\varepsilon}\left[\frac{S\left\{\Im^{(n)}(\delta),\varepsilon\right\}}{\varepsilon}\right] = \left[\int_0^\infty \underline{\Im}^{(n)}(\delta;\vartheta)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta\,,\int_0^\infty \overline{\Im}^{(n)}(\delta;\vartheta)e^{-\left(i\sqrt[a]{\varepsilon}\right)\delta}d\delta\right]$$

$$\frac{d}{d\varepsilon}\left[\frac{S\{\mathfrak{I}^{(n)}(\delta),\varepsilon\}}{\varepsilon}\right]=-(i\sqrt[a]{\varepsilon})\int_0^\infty \underline{\mathfrak{I}}^{(n)}(\delta;\vartheta)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta\,,-(\sqrt[2n]{\varepsilon}+\varepsilon)\int_0^\infty \overline{\mathfrak{I}}^{(n)}(\delta;\vartheta)e^{-(i\sqrt[a]{\varepsilon})\delta}d\delta$$

From equation 2:

$$\frac{d}{d\varepsilon}\left[\frac{S\{\mathfrak{I}^{(n)}(\delta),\varepsilon\}}{\varepsilon}\right]=-(i\sqrt[a]{\varepsilon})\frac{S\{\delta\underline{\mathfrak{I}}^{(n)}(\delta;\vartheta),\varepsilon\}}{\varepsilon},-(i\sqrt[a]{\varepsilon})\frac{S\left\{\delta\overline{\mathfrak{I}}^{(n)}(\delta;\vartheta),\varepsilon\right\}}{\varepsilon}$$

$$\frac{d}{d\varepsilon}\left[\frac{S\{\mathfrak{I}^{(n)}(\delta),\varepsilon\}}{\varepsilon}\right]=-(i\sqrt[a]{\varepsilon})\frac{S\{\delta\mathfrak{I}^{(n)}(\delta;\vartheta),\varepsilon\}}{\varepsilon}$$

Then:

$$S\{\delta\mathfrak{I}^{(n)}(\delta)\}=-\frac{\varepsilon}{i\sqrt[a]{\varepsilon}}\frac{d}{d\varepsilon}\left(\frac{S(\mathfrak{I}^{(n)}(\delta))}{\varepsilon}\right)$$

3.The proposed method

To begin, we use the aforementioned Kama relationship to configure the conversion function for a fuzzy transform of blocks in a specific space configuration.Converting gamma functions.
Methodological Building Blocks of the Proposed Approach
Step One: Examine the Cancer Image
Partitioning the Cancer Picture,
Part 2 - The visual and our response are governed by the beta function.
Part 3 compensating variables (x, y) Fourier expansion fuzzy transform to locate correlation based on the beta-gamma relationship
Part 4. Apply conversion filters to get rid of the noise in the background.
Part 5: Identify the damaged region in the original image and replace the part.
Part 6: Statistical analysis of illness progression and mapping of hotspots

4. Test Environment

Fifty images were obtained from several online skin cancer databases. In some cases, such as months, six months, 15 months, and 27 months, the disease period is established, and any further revisions to the disease period are also established.It was also employed in a diagnostic analysis of the condition, narrowing in on its unique manifestations. The database sample for the suggested technique is shown in Figure 1.

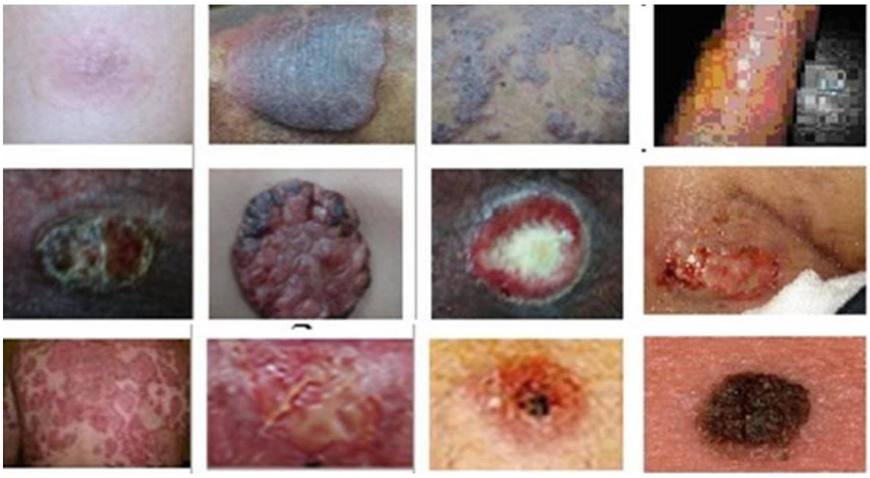

Figure 1 : Sample of the database used in the proposed method

5. Discussion and Results

A color space is a mathematical model with a specified mapping of three values that allows for the translation of color information from one setting to another by means of a collection of simultaneous ratios. Pixels must be differentiated by color to demonstrate the effect of red, green, and blue layers on a cancer image's overall effectiveness. Figure 2 dissects the cancer picture into its constituent parts.

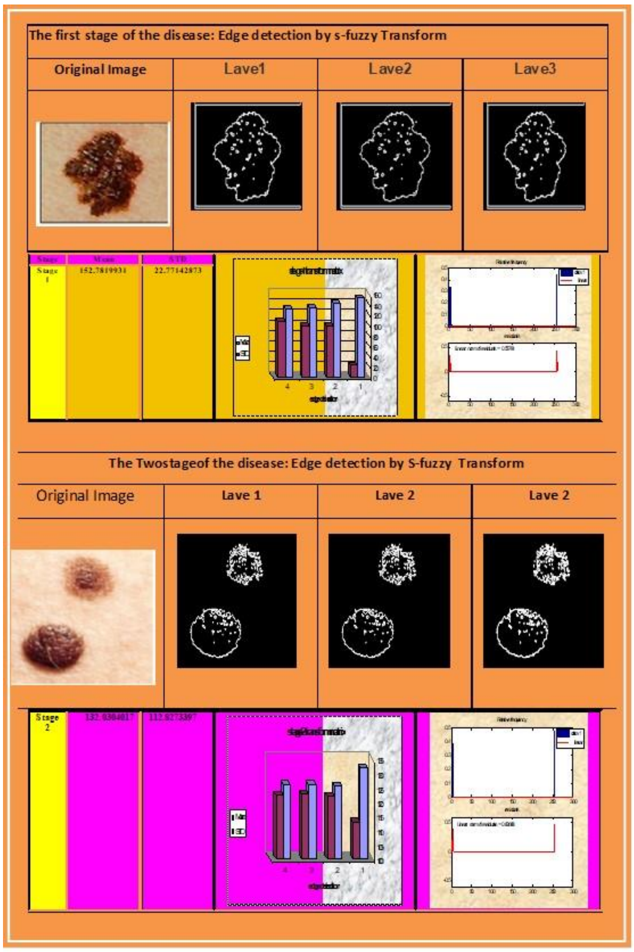

Figure 2 :Separation of the components of the cancer image.

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Under horizontal enlightenment the spectral responses of pixels at the edges alter, but in a different way (color transmission is only slightly reduced). This is due to the performance of Conversion of Orthogonal fuzzy transform function.

Steps 3, 4, 5, and 6 of the proposed beta-beta analysis method for detecting cancer are depicted in Figure 3. The distinction is crystal evident to us. When pixels of the disease were concentrated and clearly collected to identify the location of severe and grave injury to cancer, the number of months increased.

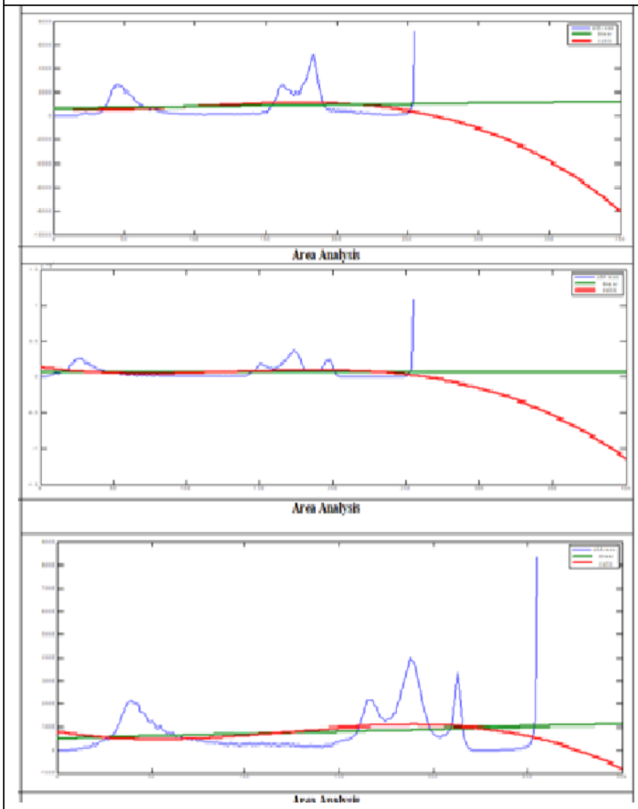
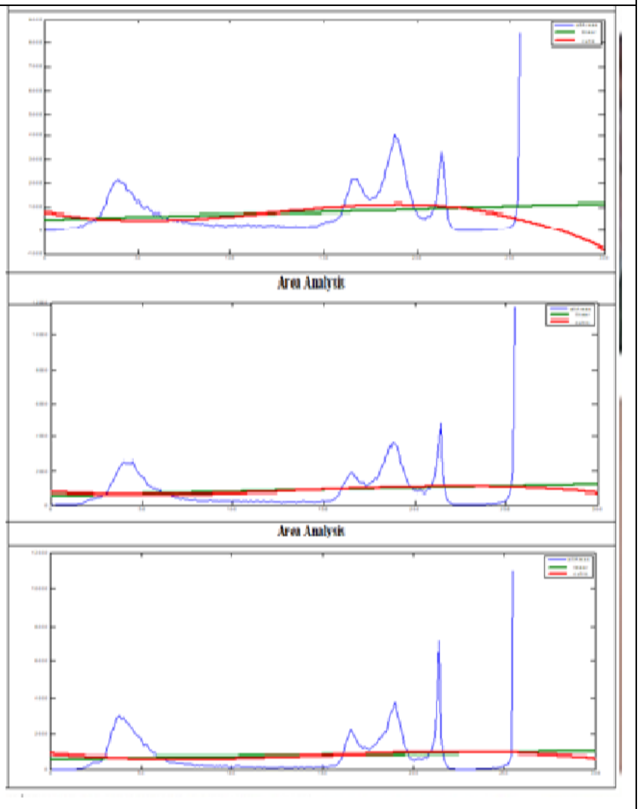
Case one and laves	Case two and laves
	

Figure3 :The steps proposed algorithm to analyze the effect of beta-beta to determine cancer

There are some extremely near pixels that appear like they're touching but actually aren't.

The algorithm cuts out the sections of the image with the most significant color layer and local performance to better differentiate between pixels within the bigger region. Once the damaged area from an image of cancer has been identified, as shown in Figure 4, the disease's concentration and spread can be seen.

Mycosis Fungoides: Medical Disorder

Topic: Although it is very rare, mycosis fungoides is one of the cutaneous malignancies that affects skin and its features are associated with the malignant proliferation of T lymphocytes.

Definition:

Mycosis Fungoides is considered a rare Skin malignancy and is also among the most slow-growing of all known cutaneous T-cell malignancies, originating from white blood cells. This disease is chronic like most other skin diseases and may take several years before the disease becomes fully visible and patients present with a rash which may be of any type(27-29).

Causes:

HIV is a known trigger of Mycosis fungoides; however, the specific cause of the disease remains undetermined despite evidence indicating that it is precipitated by a parasitic fungus. However, as tests have pointed out that there could be a genetic root to this disease, scholars still point out certain traits of genetic and immunity risk factors in the creation of schizophrenia. It has also been hypothesized that maybe there are also certain pathologies that result from the effects of some chemicals or infections over time(11).

Topic: MF is a particularly infrequent cutaneous lymphoma that begins with pruritic skin papules/macules and/ or plaques or infiltrated nodules coming in clusters.

Symptoms:

1. Early Stage:

- Inflammations or red skin inflammations that are itchy, scaly, and pink or red in some cases and can be confused with eczema or psoriasis(12).
- There was an itching and irritation feeling at the sites where the infection had occurred. (22).

2. Advanced Stage(14):

- Dermis the thick skin and the prognosis of the formation of tumors.
- Depression and Malignant, diseases that make one to have sleepless night; They are real we were told by Managing Director.
- Most commonly, it affects skin and mucous membranes, but it can get into bones, blood, lymph nodes and internal organs in severe cases.

Diagnosis:

Diagnosis typically involves a combination of:The diagnostic procedure generally entails:

- Skin Biopsy: Enumerated as follows is a procedure which involved use of the microscope to direct light on the skin tissue in an attempt to identify the invasive cancerous T-cells.
- Blood Tests: At a time when you want to know whether it is present or to confirm that you are having any infection which may not be easily noticeable.
- Imaging Tests: As in the case of CT or PET scans to determine whether cancer has spread to for instance lymph nodes. (15)

Treatment Approaches:

1. Topical Treatments:
   - Prescription of glucocorticoids to reduce inflammation.
   - Where Retinoids are used the growth of cells is put under check (16).
   - Irradiation using ultraviolet light as a photocytotoxic treatment to the affected cancer cells.
2. Systemic Treatments:
   - Systemic therapy can involve an oral medication, an injected medication like chemotherapy, or a biologic agent.
   - Immunotherapy in the form of using antibodies or other medications to enhance the body’s ability to fight cancer cells(17).
3. Radiation Therapy:
   - Cancerous cells localized in the skin are irradiated in order to destroy them by specific radiation.

4. Stem Cell Transplant:
- In severe scenarios, additional treatments that involve stem cell transplantations could be utilized to infuse healthy cells into the body replacing the unhealthy ones(18).

Topic: These prognostic factors include the stage of mycosis fungoides as well as the patient age, disease subtype, and response to first treatment: Living with Mycosis Fungoides

Prognosis:

The life expectancy of Mycosis fungoides depends on the stage the patient has reached at the time of diagnosis, and the effectiveness of the therapy. The disease has an indolent presentation in the early stages and can be controlled by the administration of appropriate treatment, and therefore a significant number of patients are able to lead normal lives. It may mean a more aggressive form of treatment in late stage and carries a more unfavorable outlook(19).

Living with Mycosis Fungoides:

To cope with Mycosis fungoides a patient needs to be on close follow-up with his physician, take his treatment regimen seriously and be ready to adopt various changes in lifestyle to deal with Mycosis fungoides symptoms or side-effects of undergoing treatment. Internet forums and counseling may help for given feelings and psychological motives(20).

6 Conclusions

In this study, we present a method for detecting cancer at different stages through analysis using a fuzzy orthogonal transform. The proposed method was successfully used to accurately detect the disease and localize the spread of contaminated pixels to a single location, which corresponds to a region of severe harm.Specifically, we employed these statistical features: As lung cancer progresses, its entropy, mean, energy, and contrast all rise. As the progression of cancer progresses, homogeneity, median, and correlation are all minimized.

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