Polarized Hyper-spectral Imaging Trending in Bioinformatics

Azra Tabassum*

Department of Chemical Engineering, Banasthali University, India

Correspondence to:

Azra Tabassum
Department of Chemical Engineering, Banasthali University, India. Phone: +919059543110
E-mail: azra12tabbu@gmail.com

Citation: Tabassum A (2021). Polarized Hyper-spectral Imaging Trending in Bioinformatics. EJBI. 17(1): 03
DOI: 10.24105/ejbi.2021.17.1.03
Received: January 08, 2021
Accepted: January 22, 2021
Published: January 29, 2021

Introduction

In this study states that the proposed and designed a transference mode polarized hyper spectral imaging microscope. The hyper spectral imaging individuals are based on the snaps can with a hyper spectral camera. The hyper spectral imaging wavelength ranges from 460-800 nm.

Polarized light imaging is realized by the combination of two polarizers and two liquid crystal individual retarders who are capable of full stoke polar metric imaging.

The new imaging appliance was tested for the observation of squamous cell carcinoma in the stained oral tissue slides of some patients. One normal area and one cancerous area on each slide are choosing to make the comparison.

The preliminary consequences indicated that the spectral curves of the Stokes vector specification of the normal area on the stained oral tissue slides are non-identical from those of squamous cell carcinoma in certain wavelength range. Further work is essential to apply the new polarized hyper spectral imaging microscope to a large number of patient specimens and to test the polarized hyper spectral imaging microscope system in unrelated cancer types.

Keywords

Polarized Hyper-spectral Imaging, Visual Representation, Phylogenetic Analysis, Artificial Intelligence, Neural network, Machine Learning

Objective

Polarization imaging is a productive optical imaging plan of action to explore the structure and morphology of biological tissues through acquiring their polarization characteristics. It can acquire two-dimensional space polarization information of the tissue which reflects various physical properties of the tissue, including surface texture, surface unpolished and surface configuration information.

Polarized hyper spectral imaging is an amalgamation of polarization quantification, hyper spectral calculation and space imaging technology which can obtain the polarization, spectral and image information of the object simultaneously. A simple test of biological credibility where measured results are differentiate to known published, physiologically reasonable values, might lead to better algorithms and more precisely reflect the underlying biology.

Instead, the people can see instances of results that are incompatible to physiological expectations such as local variation in oxygen saturation under perfectly normal pigmented nevi data showing that people of different races have different regional oxygen saturation or that collagen fluorescence is divergent under pigmented and non-pigmented regions.

This is the first polarized hyper spectral microscope based on snaps can with the capability of full Stokes imaging. This is also the first study to use polarized hyper spectral imaging for observation of head and neck cancer.

The demonstrated the variability and beneficial of polarization-sensitive hyper spectral imaging as a noninvasively technique for determining anatomical and functional characteristics of skin with melanin or haemoglobin individuals.

The obtainment of two oppositely linear polarized hyper spectral data cubes and an examination of algorithm that developed have eliminated the effect of attenuation due to superficial melanin and scattering and provided a polarized contracting function for more accurate skin chromosphere measurement than current multi-wavelength imaging techniques that result in doubtful correlations between melanin and haemoglobin in their chromosphere maps or in implausible oxygen saturation for skin with high melanin content.

Conclusion

This is the first polarized hyperspectral microscope based on snaps can with the potentiality of full Stokes imaging. This is also the first study to use polarized hyperspectral imaging for examination of head and neck cancer.

More work need to be carried out on the statistical analysis of stokes vector guidelines on more samples and cancer types. It is also worthy to apply machine learning methods in the categorization task based on the polarized hyperspectral data cube.