TWIST

A Review on Innovation of Artificial Intelligence in Cutaneous Oncology

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Abstract
Artificial Intelligence (AI) is the system consisting of programs that are made in a computer used to replicate human reasoning and features like learning, creativity and responsiveness. The artificial intelligence system is faster comparatively to the human, because it's faster, autonomous and have no physiological needs and AI system may outperform humans in various occasions like variety of tasks, especially in the medical field in recent times. After the arrival of AI systems, Radiology and Pathology are the areas were highly beneficial. Nowadays, due to etiological factors, increasing in the skin cancer is trending. Australia is the skin cancer capital of the world and had the highest overall rate of non-melanoma skin cancer in 2020, followed by New Zealand. In this disease, skin biopsy and Histopathology findings are the commonest investigations. The artificial intelligence system plays major role in the category of Melanoma, Non-Melanoma skin cancers. Diagnostic procedures are simplified in recent times and there is a diagnostic application which is available even in smart phones to track easily. Risks include, smartphone application may lead some risks, especially if it shows negative results and treatment or detection may delay. It is concluded as it's hard to claim that an AI system helps to show 100% success rate, but deep learning or conventional machine learning showing better results. Also, some publications have reported that it shows superior results to the Dermatologist.

INTRODUCTION

Cutaneous oncology is the term used to describe skin cancer and is known to be very common in Western countries and more common in Asian countries. Skin cancers differ from other carcinomas through visible to our eyes and skin biopsy is very essential for the diagnosis of skin cancer [1].

In recent times addition of "Dermoscopy", which allows non-invasive visual of the upper dermis level of skin lesions with a usual 10 – fold magnification adds to the storage of image and technique for analysis, foreshadowing breakthroughs in skin cancer diagnostic criteria [2].

The increase of skin cancer is a global trend, Australia is a Table Toppers in this kind of cutaneous oncology. The increase in the skin cancer is due to the aging of the population, increased in outdoor activities, UV exposure, cosmetic products and no awareness about the cutaneous diseases. It's impossible to confirm all the pigmented lesions through biopsy due to pain and Scar formation, due to this visual inspection performed by the better experienced dermatologist is the ideal way and needs a device that can change over time in skin is highly beneficial to prevent long wrong site surgery. This paper presents a detailed review of clinical application of artificial intelligence and implementation in the field of cutaneous oncology diseases [3].

AIM AND OBJECTIVES

The objective of this research is to explore the how Artificial Intelligence AI working on monitoring the progresses of the skin cancer patients accurately and effectively. Through a systemic review based approach, we aim to clarify what are the current uses of AI in oncology by a special focus on appliances already approved. The goal is to help patients to pre detect the skin cancer [4].

METHODS AND METHODOLOGY

In this prospective, it's easy to gather and store pictures of skin cancer lesions in a very easy way using a smartphone. Artificial intelligence technologies are introduced to improve the quality of the treatment and ideal tool to increase the efficiency of the treatment which reduces the burden of dermatologists [5].

Basic concepts of Artificial intelligence: AI is a computer science that resolves problems by doing better than human intelligence and this requires recognition of patterns in the various fields. It includes conventional machine learning, precise engineering knowledge and extensive experience are required to design features depends upon the needs. Deep learning method uses a deep neural network system to learn the features which are obtained by simple but non-linear modules [6].

APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN CUTANEOUS ONCOLOGY

Conventional machine learning:

Conventional machine learning that extracts the specific features from Dermoscopy images.

Example: The grey level Co occurrence matrix [GLCM] is used to obtain the extract texture features and this method train classifiers using the extract classifiers [7].

Machine Learning:

Machine learning is the division of AI that computer systems learn from their experience without the programmed function and it also includes supervised, semi supervised or unsupervised processes. Through trial and error, the machine learnt to select the correct response [8].

Deep learning in skin cancer:

Codella et al. is the international skin collaboration that creates conglomeration of deep learning algorithms compared to others, in addition Dermoscopy is clinical application that provides better and accurate results.

The performance was better across subgroups of other learning. At last, as the result the ML algorithm provides a more accurate diagnosis than the human [9].

ALGORITHMS FOR LEARNING IN SKIN CANCER

The high occurrence of the skin malignancies, the requirement of the diagnosis, treatment and monitoring are forced to be in a superficial way. The inclusion of the Artificial intelligence application can teach people to be more aware even after the occurrence of the skin malignancies and skin lesions assigned in classes such as "Benign" and " Malignant" or "Naevi" or " Melanoma" in order to perform the treatment in the successful manner.

This algorithm is taught on a large number of photos in order to perform a procedure or treatment and there are three basic parts to the procedure [10].

STAGES

It's classified into three stages:

- **Stage I**

The ground truth is lesion diagnosis, that is determined by an experienced dermatologist or from the historical studies

- **Stage II**

Convolutional layers may extract the featuring map from the images, feature map is a visual representation of the data that has several degrees of abstraction and Low level features like edges, corners and forms are extracted by the 1st convolutional layers.

- **Stage III**

This is the ideal tool to recognise the skin lesions and later on convolution layers extract high level data. The machine learning classifies the user to feature maps in stage 3 to recognise the distinctive layers present in the skin lesion patters [11].
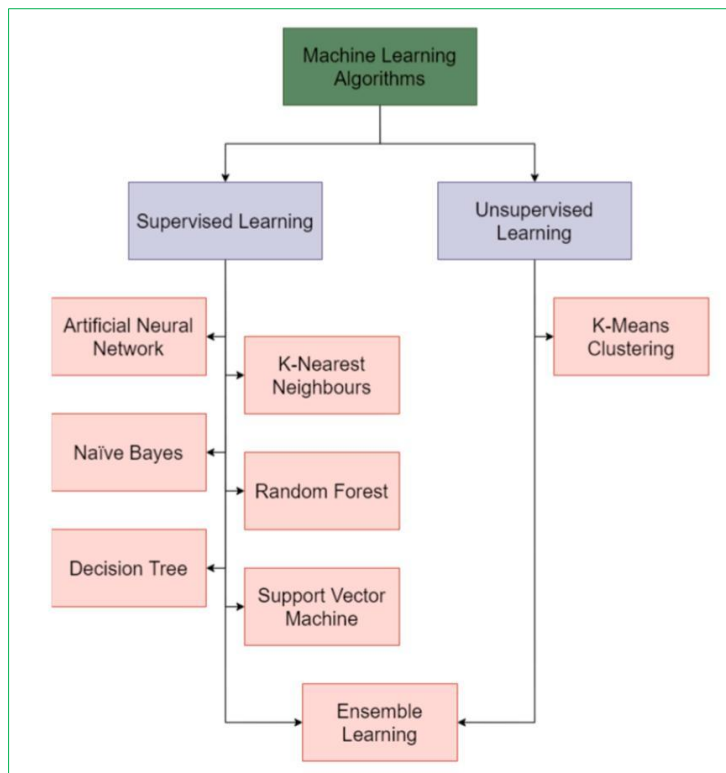
CLINICAL IMAGES

In Cutaneous Oncology, various types of lesions are routinely captured using cameras by using remote assessment and assimilation into patient medical records. Yang et al. Achieved clinically observed skin lesions that utilizing the well-known ABCD rule. It received 57.62% accuracy rate that shows the best performing rate. Dermatologist confirms that the diagnosis of skin cancer by histopathological examination of a tissue using microscope. Deep learning methodologies have been successful for digital pathology and this used to classify biopsy tissue specimens between different dermatologist [12].

AI ACCEPTANCE BY PATIENTS AND CLINICIANS

This could be the very encouraging and interesting finding and acceptance of the commodities plays a vital role which shows the success of any health care field and another important finding is was patient with history of Melanoma were inclined. Artificial intelligence will not replace clinicians, but it rather assists in better way to show the successful diagnosis and treatment protocol. It all depends upon the acceptance of the clinicians is the major thing [13].

RESULT

AI algorithms helps to the Dermatologists to provide better skin care whether they have a better understanding of AI ideas and also this reduces the probability of the errors and increase the precision of the diagnosis and management [14].

DISCUSSION

Most of the Dermatologist should not see AI as the threat to their expertise and in the next years it can be used as a supplementary to Clinical practices. Clinicians are suggested to appreciate developing technology to provide better patient care and hence, they are also expected to update their knowledge and understanding towards the disease and the available diagnostic and management methods in order to provide patients a comfortable and fearless treatment experience [15].

CONCLUSION

In the discipline of the cutaneous oncology, Artificial intelligence is the awesome thing which is currently gaining quick attraction. It shows potential role in the patient care and accuracy of the screening for the skin lesions without possibilities of natural errors.

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