IPI SINGAPORE — Innovation Partner for Impact

TECH OFFER

Sub-Skin and Gut Microbiome Health Analysis by Smartphone App

Spectrograph Image

Entropy of Image : 7.275143

Result Image
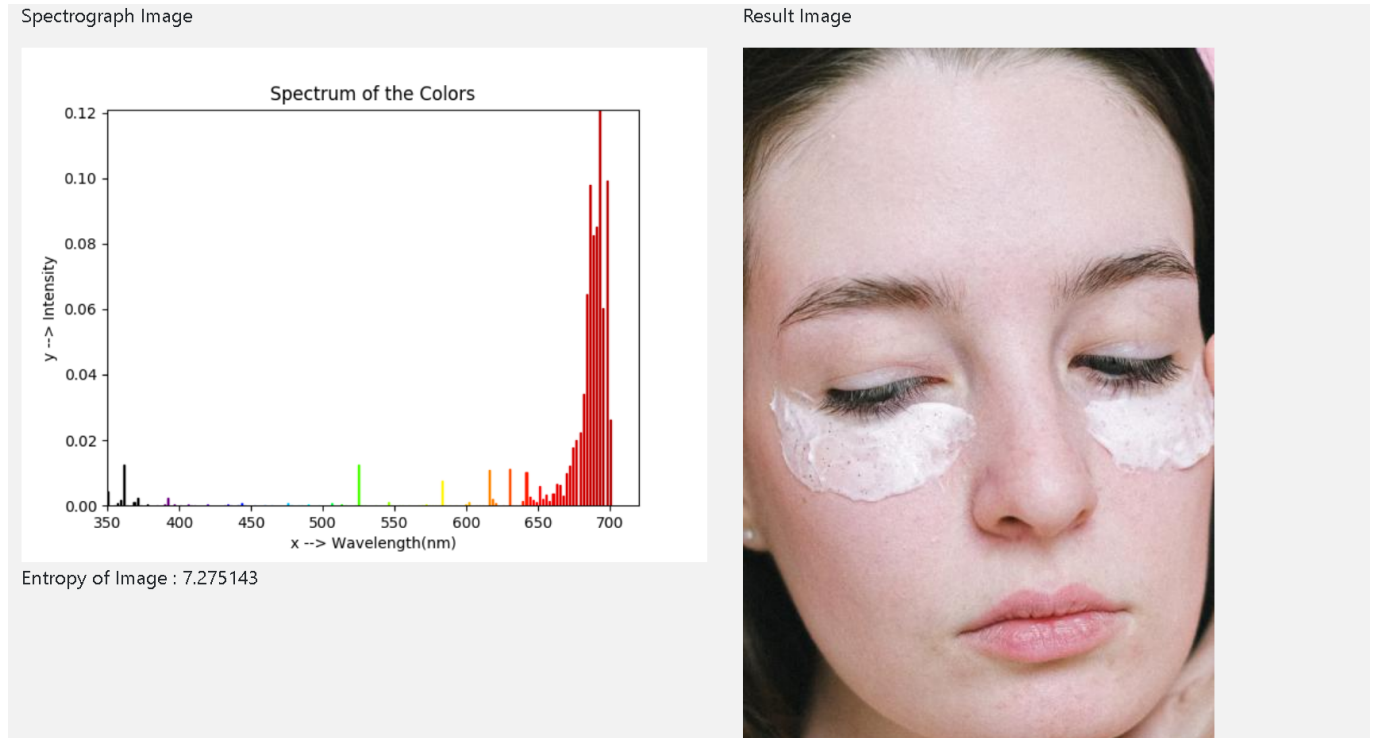
KEY INFORMATION

TECHNOLOGY CATEGORY:

Healthcare - Medical Devices
Personal Care - Cosmetics & Hair
Infocomm - Video/Image Analysis & Computer Vision
Infocomm - Healthcare ICT

TECHNOLOGY READINESS LEVEL (TRL): **TRL6**
COUNTRY: **UNITED KINGDOM**
ID NUMBER: **TO174340**

OVERVIEW

Conventional diagnostic imaging of the skin involves the use of dermatoscopes. Dermatoscopes use skin surface microscopy to examine dermal and sub-dermal tissues to diagnose skin problems. However, these devices can be costly and provide a limited view of the immediate skin surface. This limitation meant that dermatoscopes have to be used in direct contact with the patient's skin. Because of this, they can only be used to image patients in the same physical location as the clinician conducting the examination.

The overall result is that only a tiny portion of the global dermatology patient-base can be reached cost-effectively and efficiently. Telemedicine and telehealth network operations are rapidly developing ways to address patients broadly and at lower costs for them and their care providers. Yet, such tools neither deliver desmatoscope-like functionality nor improved it in way that it allows patients' skins to be examined and analysed during an online medical consultation with a general practitioner.

In order to facilitate remote skin disease diagnosis, the use of software is required to acquire and share images in real-time and ideally, by the patients themselves. This software enables patients to take their medical sub-skin images with their mobile, tablet or laptop cameras, and securely share it with doctors. Crucially, dermatoscopy images can also be used with the technology to improve diagnostic accuracy.

This technology is intended to position itself as a technology which when scaled-up, could allow for products that can enable optical biopsy and phototherapy.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology, Remote Diagnostic Imaging (RDI) is available in two modes: Real-Time (RT) and Store-and-Forward (SAF):

- RT provides remote real-time examination of the patient's sub-skin by a clinician.
- SAF enables the patient to snap and forward the sub-skin images to the clinician for assessment.

A non-clinician staff member at a clinic can also help the patient to take the images and forward them to a skin specialist. This remote imaging diagnostics is intended to facilitate time and cost savings for both doctors and patients.

The RDI service consists of proprietary software that works with any smart camera device such as mobile, tablet or laptop cameras. An individual at any remote location could take photographs of suspicious skin lesions, and then forward it to the doctor. While the functionality is similar to most image-sharing software, what sets the software apart from other algorithms is the presence of a sophisticated algorithm that acquires sub-skin features of the skin (in normal light) thereby noticing skin issues prior to manifestation on the skin surface.

POTENTIAL APPLICATIONS

Cosmetic and Medical Dermatology - With 3rd party software, this skin imaging software platform has the potential to facilitate more accurate diagnosis and management of a range of skin diseases, such as psoriasis, acne, vitiligo and dermatitis, to more serious and potentially fatal conditions of melanoma.

Optical Biopsy - Completing initial tissue analysis in a few minutes.

Phototherapy - Producing the skin and tissue pectral data needed to deliver the correct type and dosage of opticat radiation.

Podiatry (diabetes) – Diabetic patients can suffer from numbness in their feet, potentially leading to foot infections which if left untreated may necessitate amputation. The RDI and proposed multispectral imaging solutions can help podiatrists gain advance notice and clarity of potential issues. The key benefit being a better patient outcome.

X-ray (radiology) – X-ray radiation continues to be a major cause for health concern despite its significant benefit in patient diagnostics. It is also not known for being able to render soft tissue visual detail in the way that MRI and ultrasound does. Both RDI service and multispectral imaging embedded technology enable the use of pre-existing X-ray images to be used to acquire visualisation of more detail. The key benefit is reduced radiation dosage which results in less risk to the health of the patient.

MARKET TRENDS & OPPORTUNITIES

In the near future, it is expected that an absorbed multispectral-based imaging app or device as well as the embeddable

diagnostic platform will become an integral part of a smart diagnostics platform for remote clinical diagnosis. Dermatology clinics and hospitals can use these solutions for the remote diagnosis of any type of skin disease, track the progress of a patient condition after treatment, and better engage patients in the treatment process by empowering them to take proper preemptive care of their skin health.

The technology is available as an embeddable algorithm, and as a secured cloud-based service that can be embedded to a website.

The embeddable version of the technology is available in a licence or co-creation form. It can be embedded in OEM devices, equipment and machines.

UNIQUE VALUE PROPOSITION

Some of the advantages of this innovative technology are as follows:

- Skincare consumers and patients can self-analyse and monitor their skin's health from the comfort and privacy of their home, while having their skin analysed visually. Information can be shared in real time with their skin specialist
- Provides an ability to visually 'see' the skin as light sees it and interacts with it on the surface and beneath opens up new diagnosis and treatment opportunities
- Synergenic tool for integration into the rapidly expanding telehealth platforms out in the market
- Potential to enable diagnosis of skin conditions as well as setup of pre-signal detection to alert potential skin conditions before they are visibly present.
- Enable storing of historical sub-skin imaging data through the SAF feature, this allows for image analysis overtime.