SIHEALTH

Sensing & Intelligence for HealthCare

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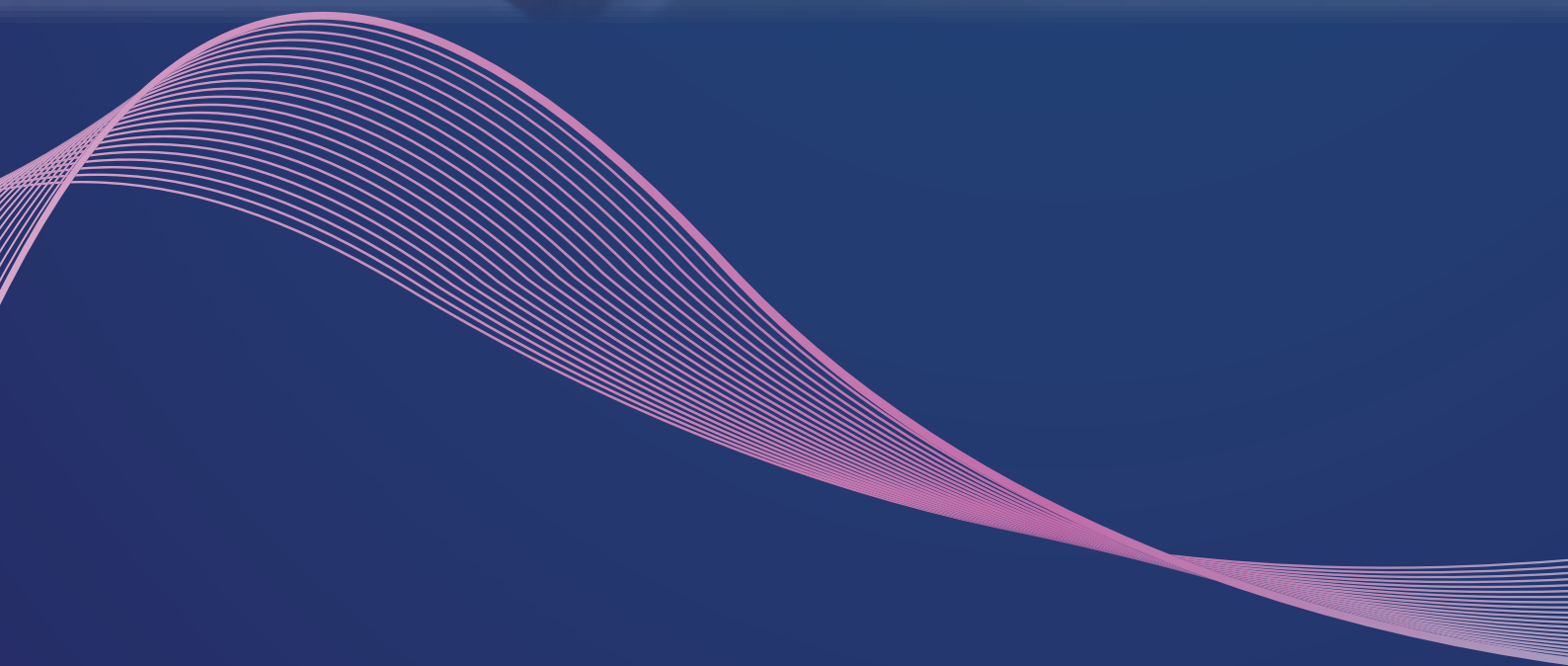
DIAGNOSTICS AND INTELLIGENCE IN HEALTHCARE

SI - it means Yes in Italian language, the simplest, positive and decisive word.
It includes the heritage of several years dedicated to scientific research, that finally made possible a new standard of Information Technology solutions for health and quality of life.

S - like Sensing: the company know-how in satellite imagery processing and in radiometric systems provides a unique capacity to obtain geo-referenced environmental parameters and to couple them with clinical parameters retrieved by innovative remote sensing diagnostics methodologies.

I - like Intelligence: the competence to extract increasingly deep insight knowledge from data, enables more effective decision support to healthcare operators as well as to pharmacological companies.

siHealth, the new business unit dedicated to smart solutions in Health & Wellness grow out from **the unique know-how** of Flyby - based on its expertise in the aerospace sector.
The team features professionals specialized in complementary scientific fields, such as physics, photobiology, applied optics, computer science, imaging systems engineering.

siHealth introduces new solutions both in the sector of decision support systems dedicated to healthcare prevention and in the professional diagnostic sector for physicians and pharmacists.

SIHEALTH: Yes, HEALTHY IT'S EASY NOW!

HAPPYSUN

THE SATELLITE BASED SYSTEM FOR PERSONAL SOLAR PHOTOPROTECTION

HappySun is the innovative integrated solution for personal solar photoprotection. For the end user it works as a "personal consultant" for sun exposure through a specific smartphone app allowing for the safer and enjoyable sun bath. For the pharmacy the system allows to provide innovative photoprotection diagnostics services and the suitable sunscreen product selection through another specific tablet app equipped with optical accessories.

For the sunscreen manufacturer HappySun allows for the best geo-marketing and business intelligence management.

The **HappySun** system is based on the exploitation of data coming from different satellites enabling real time measurement of the ground-level UV radiation. The real time service is currently active over Europe, Africa and Brazil. This technology has been developed by Flyby spending more than 3 years of research & development and validation activities made in collaboration with the European Space Agency (ESA) and many public organizations bodies in the field of the environmental health protection.

SUN EXPOSURE AWARENESS

The **HappySun-User App** provides real-time personalized recommendations and useful information for a safe sun exposure: user phototype and Minimal Erythemal Dose (MED) are calculated by an expert system based on an anamnestic questionnaire.

Once both the user phototype and UV radiation have been determined for the exposure location, according to the smartphone's GPS, HappySun immediately calculates the personal safe-exposure time, taking into account of the SPF (Sun Protection Factor of the sunscreen applied.

HappySun is a simple and reliable solar photoprotection solution, the only one that allows for a continuous monitoring of the UV radiation incident on the skin, taking also into account the ground-reflected radiation surrounding the user.

The **HappySun-User App** is free and runs both on Android and iOS smarthphones and will be soon available in six languages (English, Italian, Spanish, Portuguese, French, German).

SOLAR PHOTOPROTECTION SERVICE IN PHARMACY

HappySun also enables pharmacies to deploy a new solar photoprotection service to their customers. The **HappySun-Pharma App** optimised for tablets, allows the pharmacist to diagnostics the customer phototype and his skin UV sensitivity, to evaluate the intensity of local solar ultraviolet (UV) radiation for any location of the Earth and the personal sunburn time, in order to suggest to the customer the most suitable sunscreen SPF (Sun Protection Factor) for his skin and for his planned journey location.
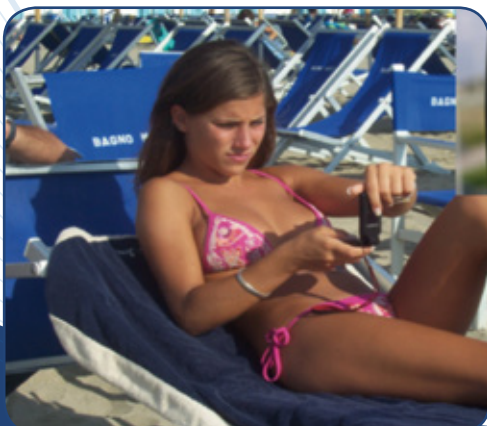
HappySun has been clinically tested in European research projects, in collaboration with:

- Associazione Contro il Melanoma – Italian Melanoma Fighting Association (ACM)
- Italian Ministry of Health - ISPESL
- Dermatological Clinics of the Federico II University of Naples
- Biophysics Institute of the National Research Council - CNR
- Environmental Protection Agency of Tuscany - ARPAT
- Environmental Protection Agency of Sicily - ARPA Sicilia

A NEW PARADIGM FOR THE SUNSCREEN MARKET

HappySun represents an innovative key tool for the "Customer Relationship Management" for the sunscreens products manufacturers.

HappySun supports the following functions and services:

- **branded sunscreens product line selection on HappySun-User App:** the end user can select the product from the App and access directly to the related e-commerce brand web portal;
- **geomarketing:** selection of of the sunscreen product within the SPF values range available from the manufacturer. HappySun-User App will drive the consumer to the nearest point of sale on the map;
- **business intelligence:** all the operations carried out by sunbathers by means of the HappySun-User app and diagnostics collected by pharmacists with the HappySun-Pharma app are traced on a central server for statistical analysis. The most relevant statistical data for the photo-protection of consumers (e.g. customer profiles, phototypes, places of sun exposure, number of sunscreen applications, etc..) are evaluated and analysed according to statistical correlations and key performance indexes (e.g. selling pharmacy, sunscreen protective factors applied versus phototype and sunbath location, etc ..).
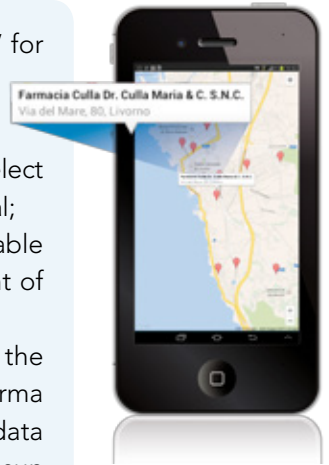
FUNCTIONALITY	FEATURE
Real time UV Index measurement	✔
UV Index forecast	✔
Ground-reflected radiation	✔
Resolution at ground (*)	5 Km
Geographical coverage	Europe/Africa/Brasil
Phototype	✔
Minimal Erythemal Dose (MED)	✔
Identification of the advised Sun Protection Factors (SPF)	✔
Advised time of exposure based on the selected SPF	✔
Sun exposure planning and decisions support during the sunbath	✔

(*) mean value for Mediterranean countries.
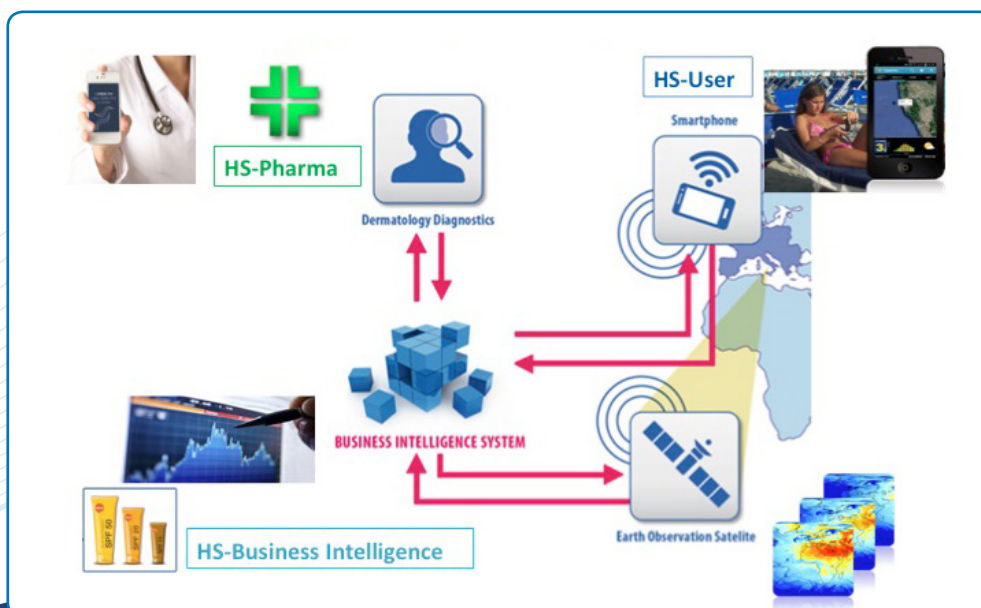
HappySun has been developed in compliance with the following international standards:
- COLIPA: European standard for the photoprotection factor of sunscreen products
- Fitzpatrick Classification for the definition of phototype
- Global UV Index Standard of the World Health Organization (WHO) and of the World Meteorological Organization (WMO)

DIAGNOSTIC IMAGES OF SENSITIVE SKIN

SensyApp is the innovative solution for the dermatological not-invasive diagnostics of sensible skin, for rapid assessment of intolerance or allergic reactions to cosmetics, and the evaluation of lenitive effects of therapeutic dermo-cosmetics products applications.

SensyApp is suitable to measure the cutaneous sensitivity to a possibly irritating cosmetic or to determine the effectiveness of a therapeutic treatment for sensitive skins by calming creams. The evaluation is performed through the acquisition of a sequence of photos taken by a dermatologist or a pharmacist using his smartphone or tablet.

Thanks to the innovative image processing functions included in the App, the Differential Erythemal Index (DEI) is accurately calculated for each point of the digital photograph allowing a quick diagnosis.
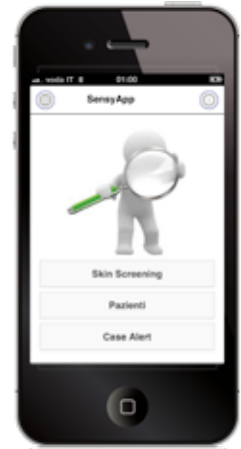
For each photo taken in the different phases of the test, **SensyApp** provides the thematic map of DEI and its average and maximum values regarding the area of interest, calculated with respect to non-treated skin.

In the App version for dermatologists, these data are also associated to the different phases of the standard Stinging Test procedure.
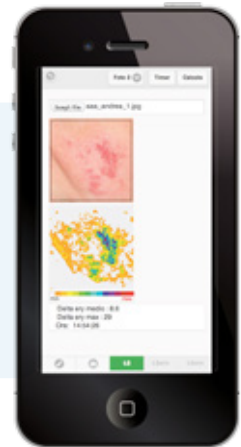
Inserted data, original and processed images and additional information notes are stored in a database easily accessible for further analyses like patient diagnostics tracing or cosmetic applications lenitive effect evaluation trend (e.g. multi-session analysis).

The dermatological test data and the related measurements of DEI could be associated to the patient, to the different zones of his body and to the particular dermocosmetic or therapeutic product applied to the cutaneous zone of interest.
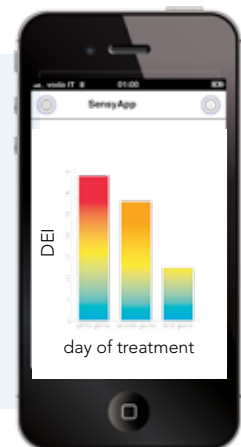
SensyApp can also works off-line making the smartphone completely independent from the mobile network during diagnostic procedures.

A dedicated plug&play optical filter applicable on the smarthphone or tablet camera can be exploited to obtain excellent measurements in the most of the environmental lighting conditions.

FUNCTIONALITY	FEATURE
Thematic map of Differential Erythemal Index (DEI)*	✔
Sensitivity	1 DEI
Range	0 - 40 DEI
Average value	DEI_ave
Maximum value	DEI_max
Multi-session analysis	✔
Stinging Test	✔
Database	✔

(*) For the definition of Differential Erythemal Index (DEI) see Dawson et al. "A theoretical and experimental study of light absorption and scattering of in-vivo skin" Phys. Med. Biol. – 1980.

SensyApp has been clinically tested by a community of fifty dermatologists, coordinated by the Dermatology Clinics of the Federico II University of Naples.

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