



SMARTHERO

KEEPING PEOPLE SAFE

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What is SMAIRTHERO?

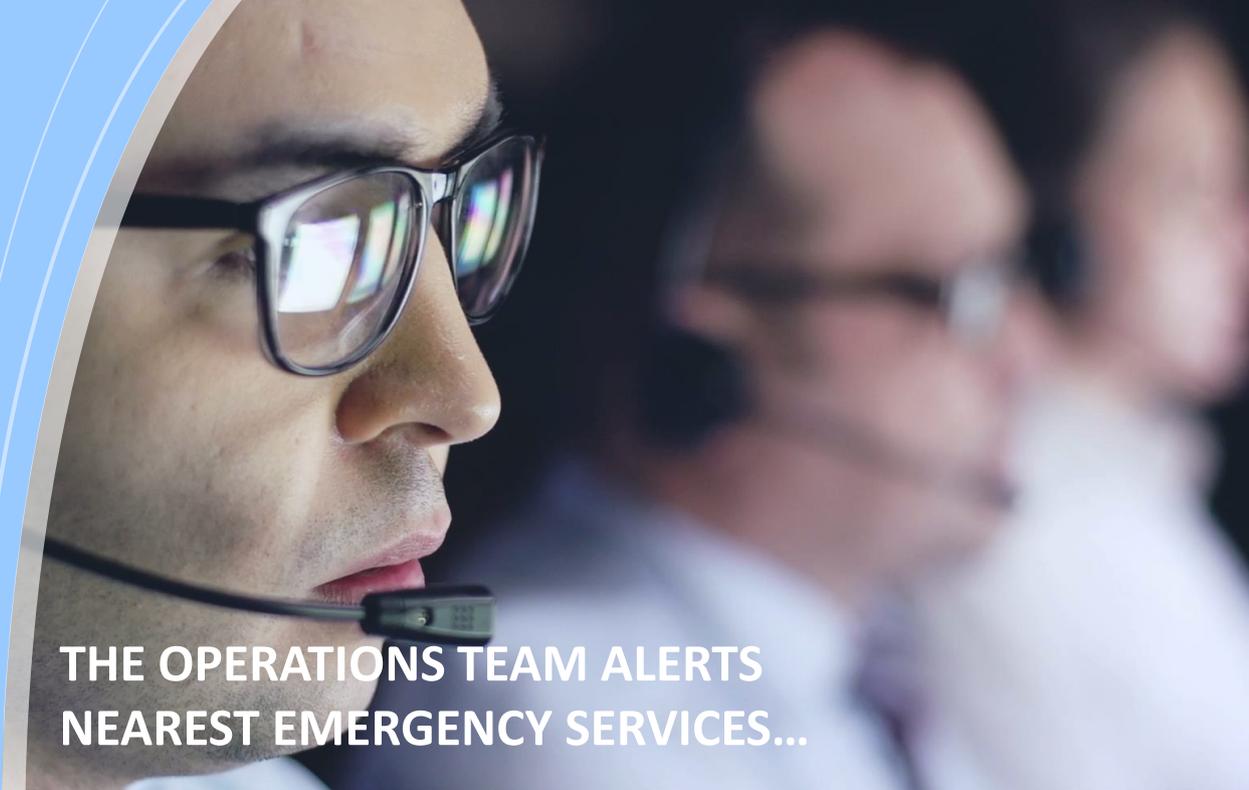
SMAIRTHERO is a **patented ecosystem** for the **safety and health of the person** and works with:

 a **wearable class IIA medical device (MAY 2021 CERTIFICATION)** equipped with biometric sensors that detects heart rate, blood oxygenation, surface temperature of the skin, falls or violent shocks.

 an **Artificial Intelligence algorithm** that compares the habitual and physiological conditions of the person with those detected in real time and **independently understands the onset of serious health risks**, such as cardiac arrest, respiratory and **safety problems**, such as aggressions, work or car accidents.

 a **24-hour Operations Center**, with the doctor on site, instantly **alerted by SMAIRTHERO** in case of alarm, without any voluntary intervention of the person.





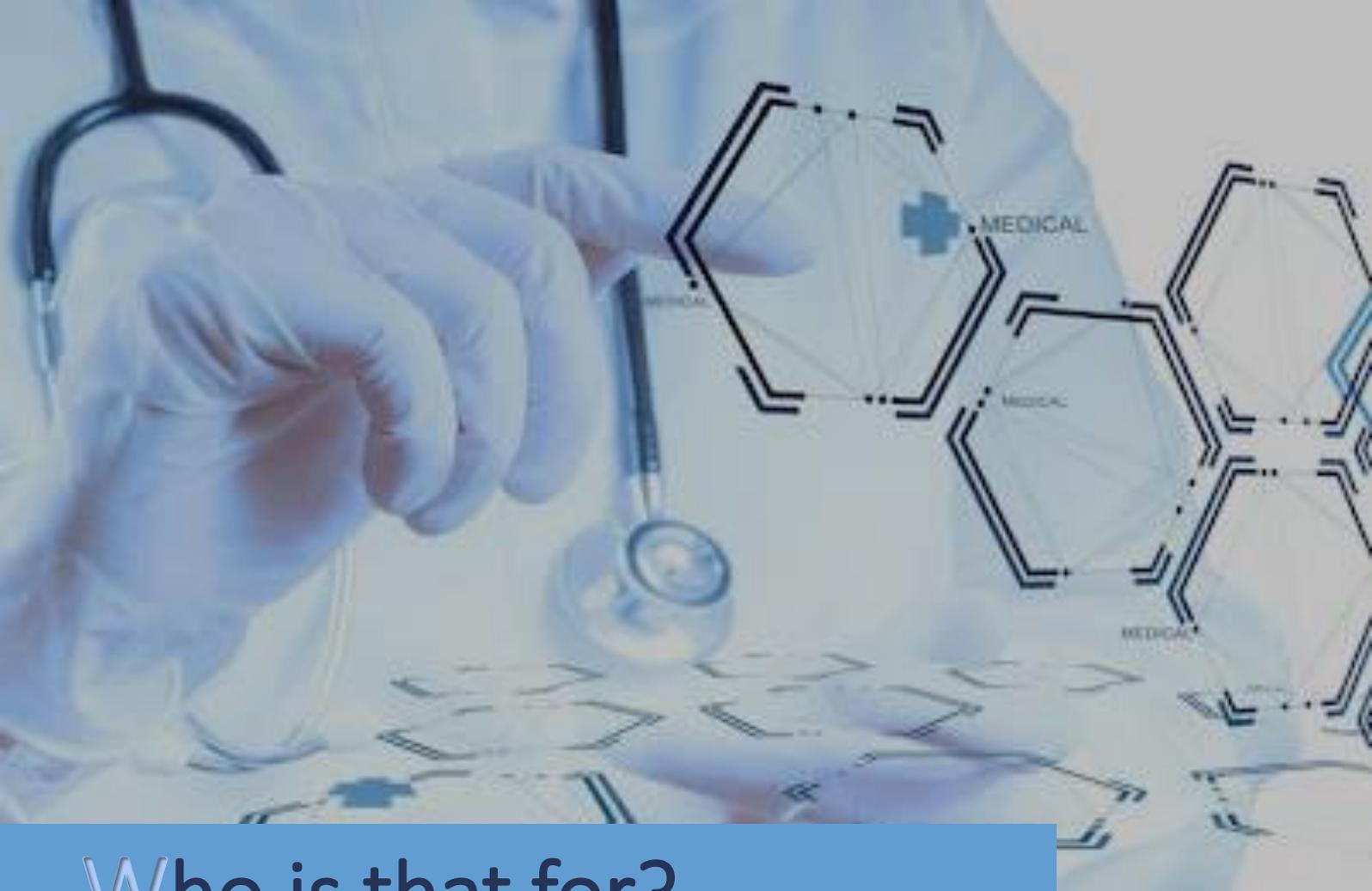
**THE OPERATIONS TEAM ALERTS
NEAREST EMERGENCY SERVICES...**



How does that work?

Upon the occurrence of any condition of **serious health risk** such as cardiac arrest, respiratory **or safety problems**, such as aggressions, work or motor accidents, SMAIRTHERO triggers, without any voluntary intervention of the person, the assistance of the H24 Operations Center, with the help of the doctor.





Who is that for?

SMAIRTHERO is the perfect medical ecosystem for those who do their work in high-risk or solo environments, for the protection of women and for the elderly and the most fragile people.



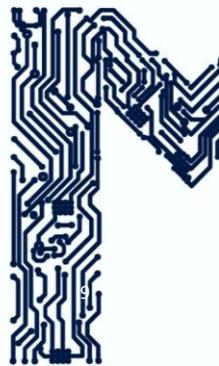
Anytime, anywhere with you...

You wear **SMAIRHERO** (on the arm like a common watch or I wear in the sock, under the shirt and anywhere else in contact with the body) and you are immediately protected by our **proprietary algorithms** (general parameters).

In the meantime, we collect data to power the **machine learning** engine.

AFTER ABOUT 2 WEEKS your **Digital IO (Avatar)** is drawn that grows and changes with your lifestyle (custom parameters).

The **AVATAR** created ensures that if the SMAIRHERO is used by another person... the AI engine notices.



(12) United States Patent
Garruzo et al.

(11) SYSTEM FOR MONITORING THE PHYSICAL CONDITION OF AT LEAST ONE USER AND METHOD FOR MONITORING THE PHYSICAL CONDITION OF A USER

(71) Applicant: Massimo Lomonte Garruzo, San Germano Chiusone (IT), Marco Mattesi, Battaglia Alta (IT), Barto Sacchi, Torino (IT)

(72) Inventors: Massimo Lomonte Garruzo, San Germano Chiusone (IT), Marco Mattesi, Battaglia Alta (IT), Barto Sacchi, Torino (IT)

(73) Name: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(a) by 0 days.

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(93) Int. Cl. Class. G06F 7/00 (2006.01)

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(56) Field of Classification Search CPC G06F 7/00 A61B 5/0006 See application file for complete search history.

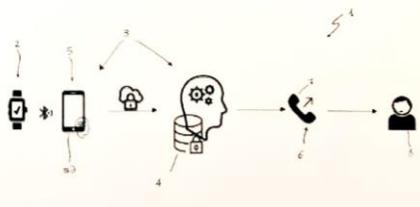
(57) References Cited U.S. PATENT DOCUMENTS 2006/0089572 A1 * 12/2006 Ranken A61B 5/1452 2006/0044043 A1 * 4/2006 Ito G06F 9/37 7050 (Continued)

(58) FOREIGN PATENT DOCUMENTS 3006/03044 11/2006

(59) Primary Examiner: Joseph H Field Assistant Examiner: Pamela Marie Mullaney (74) Attorney, Agent, or Firm: Allen, Dyer, Doppelt + Gilchrist, P.A.

(60) ABSTRACT Monitoring system of the physical condition of at least one user comprising at least one data detection device suitable to detect, by means of sensors, one or more indication data of the physical condition of the user and capable of sending said indication data to a data processing device, said data processing device being able to acquire and process the indication data received from said data detection device and able to compare such data with a range of predefined values and emitting an alarm signal when the received indication data do not fall within a range of predefined values.

(61) 14 Claims, 4 Drawing Sheets






Approvazione del Sistema Completo di Garanzia di Qualità

Full quality assurance system approval

Certificato N. **0425-MED-004483-00**
Certificate No.

Secondo l'articolo 1, paragrafo 1) della Direttiva Europea 93/42/CEE (revisata con il Dlg n. 46 del 24/02/97) e secondo l'articolo 1, paragrafo 1) della Direttiva Europea 2007/45/CE (revisata con il Dlg n. 46 del 24/02/97)

ORGANISMO NOTIFICATO / NOTIFIED BODY

ICIM S.p.A. - Identification number: 0425
Piazza Don Enrico Mapelli, 75 - 20099 Sesto San Giovanni (MI) - ITALY

VISTO L'USO DELLE VERIFICHE CONDOTTE IN CONFORMITÀ ALL'ALLEGATO A ESCLUSO IN NELLA DIRETTIVA EUROPEA 93/42/CEE (REVISATA CON IL D.L.G. N. 46 DEL 24/02/97) E NELLA DIRETTIVA EUROPEA 2007/45/CEE (REVISATA CON IL D.L.G. N. 46 DEL 24/02/97) SULLA BASE DELL'ASSESSMENT PERFORMATO ACCORDO TO ANNEX B EXCLUDING AN OF EC DIRECTIVE - SPONSE DECLARED THAT THE FULL QUALITY ASSURANCE SYSTEM EMPLOYED BY:

MACHINE ARTIFICIAL INTELLIGENCE SYSTEM - SOCIETA' A RESPONSABILITA' LIMITATA

Sede legale
Via Mazzini, 20 - 34121 Trieste (TS) - Italia

Sede Operativa:
Via Schiapparelli 12 - 10148 Torino (TO) - Italia

PER I SOGGETTI DI PRODOTTI, PROCESSI, SERVIZI
PER LE SEGUENTI AREE DI PRODOTTI, PROCESSI, SERVIZI

SmartHero - Sistema di monitoraggio e gestione dati attraverso un dispositivo indossabile che rileva il battito cardiaco, temperatura superficiale della pelle, cadute o urti violenti
SmartHero - Data monitoring and management system through a wearable device that detects heartbeat, skin surface temperature, falls or violent shocks

E' CONFORME A REQUISITI DI IN CONFORMITÀ CON REQUISITI SPECIFICI
Allegato II ESCLUSO (4) della Direttiva Europea 93/42/CEE
Annex II EXCLUDING (4) of EC Directive 93/42/CEE

Per l'identificazione dei modelli di prodotto vedere l'Allegato I. For identification of the model type see Annex I.
Espone il Certificato e lo stesso sarà reso in accompagnamento del modulo Allegato I. The Certificate is valid only with the module Annex I.



Gabriele Triso
Rappresentante Tecnico / Management Representative

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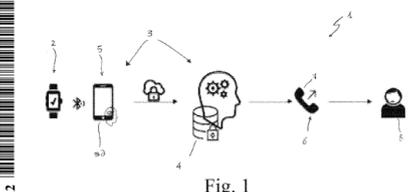
(71) Inventors and Applicants: **GARRUZZO, Massimiliano (IT) (U)**, **FRANZINI, Francesco, 1, 10065 San Germano Chiusone (IT) (U)**, **MATTESI, Marco, SACCHI, Barto**

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(81) Designated States (unless otherwise indicated, for kind of regional protection available): AE, AG, AI, AU, AT, AU, AZ, BA, BB, BG, BH, BR, BR, BR, BR, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DR, ES, FI, FR, GE, GR, HK, HU, IL, IN, JP, KR, KZ, LA, LU, LV, LY, MA, MC, MD, ME, MG, MK, MN, MU, MV, NA, NG, NI, NO, OM, PA, PE, PG, PH, PL, PT, QA, RO, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TL, TT, TZ, TT, TZ, UA, UG, US, UZ, VN, ZA, ZM, ZW

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(54) TITLE: SYSTEM FOR MONITORING THE PHYSICAL CONDITION OF AT LEAST ONE USER AND METHOD FOR MONITORING THE PHYSICAL CONDITION OF A USER



(57) Abstract: Monitoring system of the physical condition of at least one user comprising at least one data detection device to detect, by means of sensors, one or more indication data of the physical condition of the user and capable of sending said data to a data processing device, said data processing device being able to acquire and process the indication data received by the data detection device and able to compare such data with a range of predefined values and emitting an alarm signal when the indication data do not fall within a range of predefined values.

(93) Continued on next page

Patented and medical

 SMAIRTHERO's **end2end service** (i.e. the entire process, from the triggering of an alarm to the engagement of the Operations Center and the arrival of rescue) **is covered by a patent application**, with a **patent already obtained in the USA** in October 2020 and being obtained in Europe, China and Australia.

Medical certification was obtained in May 2021.

With SMAIRTHERO keep health and safety under control



HeartBeat



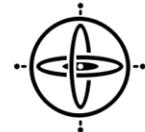
Thermal shock



SpO₂



PPG wave



Accelerometer



Crashes



Falls



Assault



Steps



Geolocation

Health and Safety: vital data

 **Heart rate** measurement

 **Blood oxygenation**
measurement (COVID-19)

 **Heart rate** measurement

 **Thermal shock** analysis

 **Accelerometer**

 **Detection of accidents and**
falls

 **Attack detection**

 **Geolocation** with the App



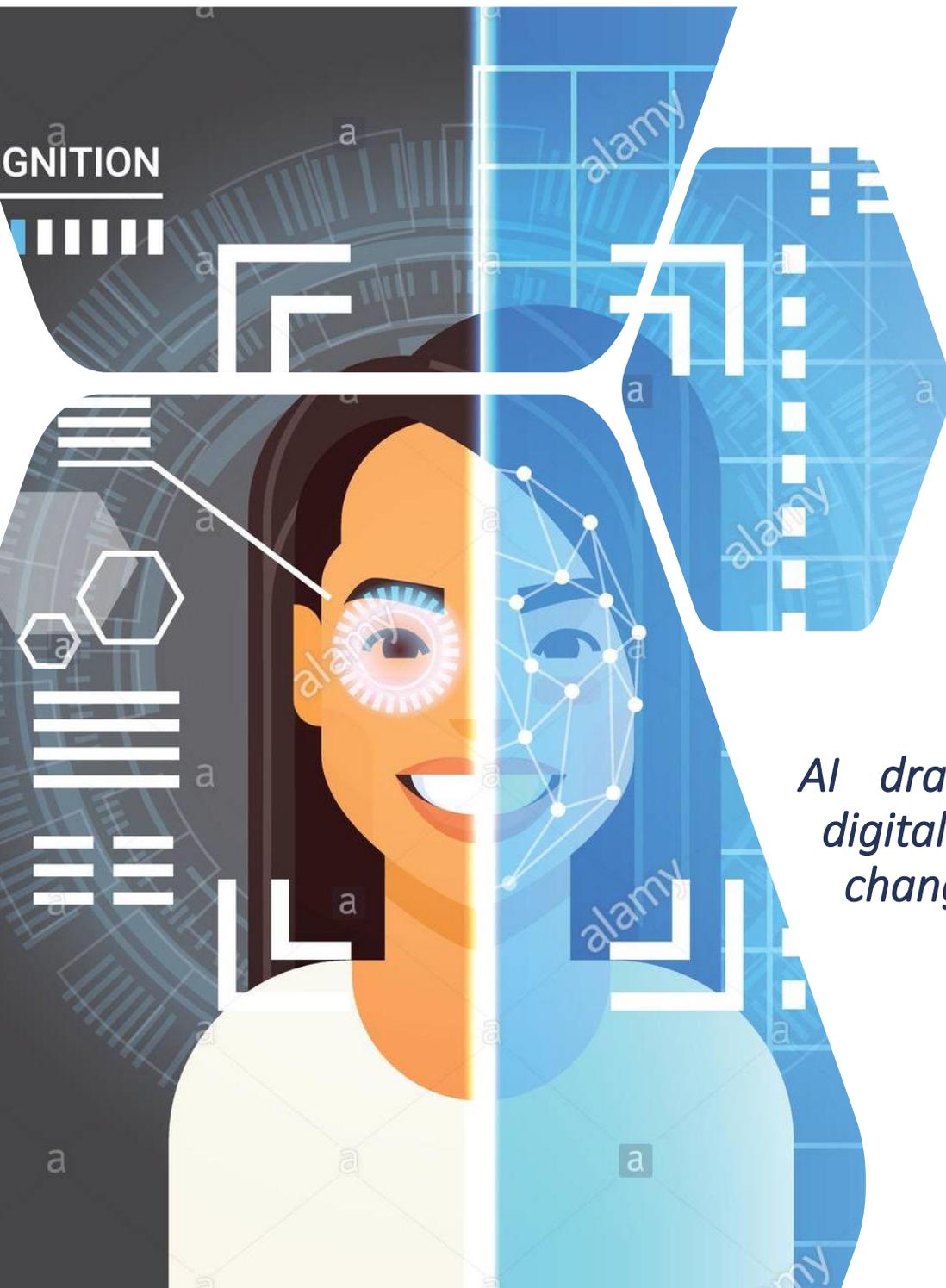
The reference market

SMAIRTHERO's business model is B2B and the target companies are:

-  Telecommunications and Energy Companies
-  Insurance for health policies and occupational risks
-  Hospitals and telemedicine facilities
-  Residences for the elderly



GNITION



AI draws your avatar digital that grows and change with your lifestyle.

What makes it unique?

 **SMAIRTHERO SW** is designed, designed and developed by MAIS.

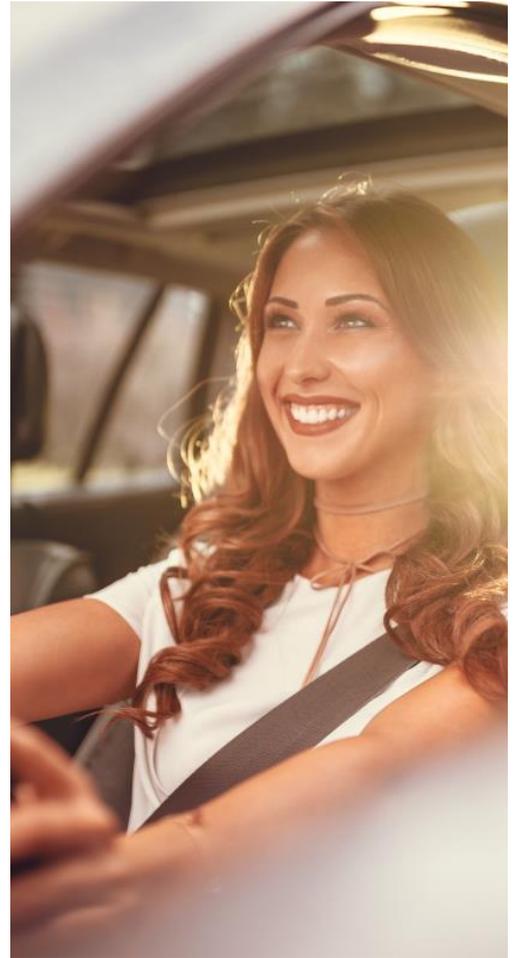
 **HW** is owned by MAIS.

SMAIRTHERO is a **patented ecosystem**. 

It is based on an innovative **artificial intelligence algorithm** that **creates the digital and unique Avatar** of the person based on its physiological characteristics **and in complete autonomy alerts the Operations Center**. 

It uses a **class IIA medical device**, the data collected of which can be transferred to the medical health record. 





SmairtHero watches over you at any time and condition

Use cases

COMPANIES

Protection of workers in the field

AGRICULTURE

Protection of workers in the field

TELEMEDICINE

Remote patient's care (COVID-19)

WOMEN

Protection of women



ELDERLY PEOPLE AT HOME OR IN RESIDENCE

Continuous monitoring

HOSPITAL

Protection in hospitals and nursing homes

INSURANCE

Reducing insurance risks

MOBILITY

Protection on the moving

Features:

- 🔌 Rechargeable
- 🔌 Duration one day
- 🔌 Long-range Bluetooth

Data collected:

- 🔌 heartbeat
- 🔌 Skin temperature
- 🔌 SpO2
- 🔌 Ppg
- 🔌 Anti-strain
- 🔌 Falls and accidents

Hardware:

- 🔌 Ip68
- 🔌 Antipanic button
- 🔌 USB-C for search

BIOMETRIC SENSOR



SMARTHERO TECNOLOGY

SMARTPHONE APP

- 🔌 Android – Apple
- 🔌 Managing 7 sensors with an Android mini tablet





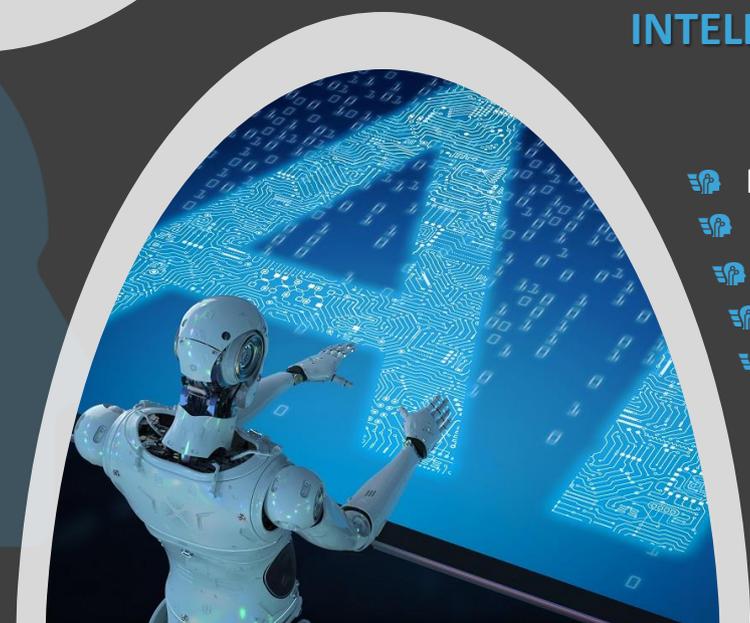
- 👤 Operators Professional
- 👤 Doctors 24/7
- 👤 Multilingual service

OPERATION CENTRE

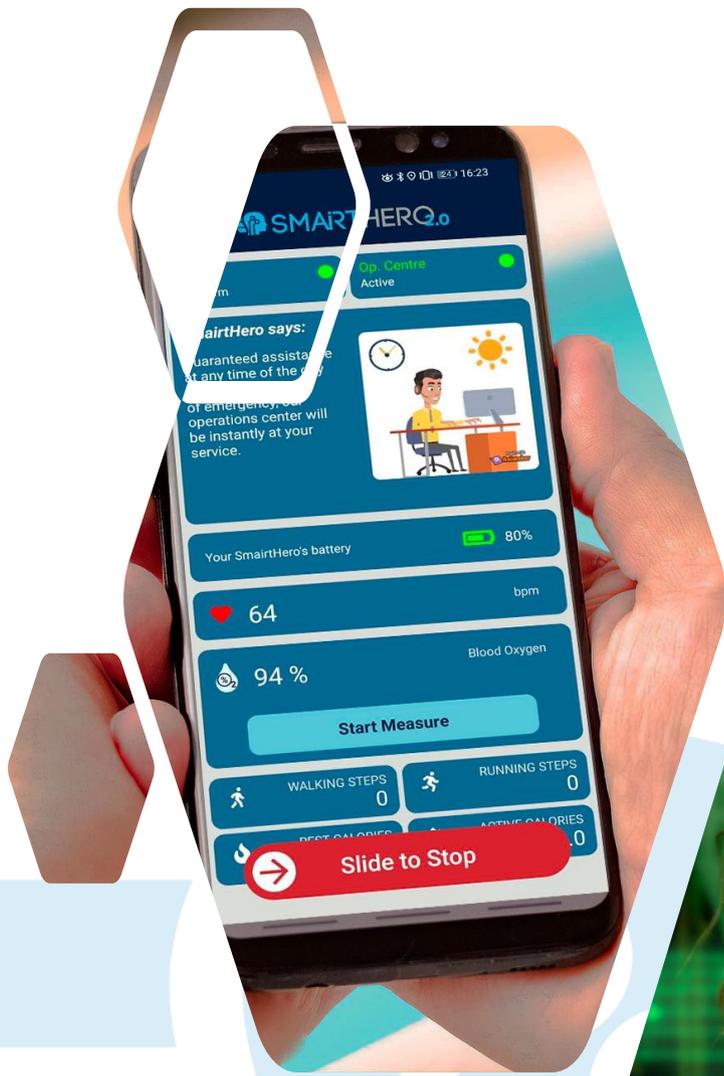
Intervention Protocol

- 👤 GPS Positioning
- 👤 Real-time biometric data analysis
- 👤 Operators call the user and ICE numbers
- 👤 Rescue services are alerted and sent to all countries covered by the service

ARTIFICIAL INTELLIGENCE



- 👤 ML/AI Features
- 👤 Scalable
- 👤 Eliminate false positives
- 👤 Automatic alarms
- 👤 Available on Cloud
- 👤 Microsoft Azure Farm
- 👤 FHIR API connector (health medical record)

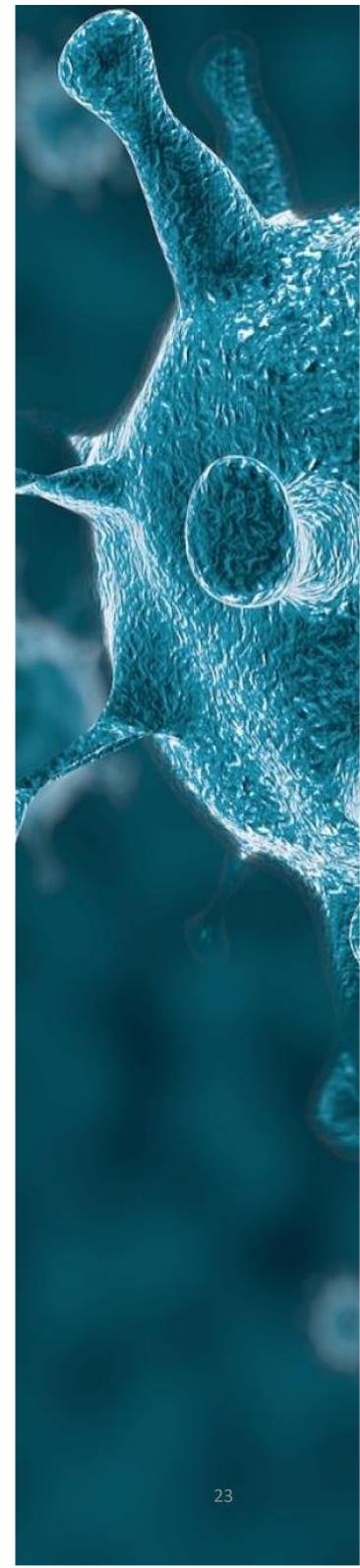


Covid-19 and SMAIRTHERO: the testimony

"My experience with Covid started at the beginning of April when I was informed that a person with whom I had come into contact, had been positive. I immediately isolated, informed the doctor and from there to very little I went to do the molecular swab and tested positive. Within hours the symptoms manifested themselves and then I began to feel sick, even a lot during the acute phase, fortunately never so bad as to be hospitalized, so I was followed by UCLA, that is, doctors who follow only covid patients residing in their homes.

I had been using the SMAIRTHERO system for a few weeks now, so, as I read on the internet, the artificial intelligence engine had already learned to know me: in fact, as I started to feel sick, my Avatar informed me via app and the device informed me that my heart rate was outside my comfort zone and I could see it in real time but the system also reassured me that my heart rate was still within the medical thresholds, thankfully.

I could also see through the app as well as being promptly informed by the Avatar of how under stress my body was when I was doing simple things like washing or taking a walk. Also have a medical device that can read oxygenation and this was fundamental because the doctors at UCLA had been very clear: if my SpO2 had dropped below 90% for at least 3 hours in a row, I would have to go immediately to the emergency room and i should have warned them promptly. And when they first came to visit me, they checked if I had an Oxymeter at my disposal, and I had my SMAIRTHERO, and they checked with three measurements that it was aligned with their professional Oxymeter... It was and it heartened me a lot, I had a reliable medical device with me in those complicated moments. Slowly, after the acute phase, I saw my oxygenation and heart rate values returning to their thresholds. I say it in one sentence: I felt monitored and protected and supervised H24, SMAIRTHERO all my life!"



The Doctor's Voice



«Having a class 2A certified medical device such as SMAIRTHERO allows doctors and family members to detect the possible onset of pathologies early.

The SpO2 sensor is used to measure the level of oxygen in the blood: in health and rest, oxygen levels should be as high as possible; if they fall below 90% there may be problems and it is therefore good to report it to your doctor.

SMAIRTHERO also allows you to measure your heart rate through a photo-plethytograph: when your physique is prone to exertion, as during physical activity, your heart rate tends to increase. Having pulse measurement under control can be of fundamental importance to identify the onset of pathologies and, more generally, to monitor the patient's physical well-being.

SMAIRTHERO also allows you to build the PPG curve in patients suffering from the so-called "vague and non-specific symptoms" and for those who want to improve their body shape or physical performance. Through the measurement of PPG, it is possible to measure the functionality of the Autonomic Nervous System and the ability of the patient to react to stress, inflammation and pathology, thus being able to plan an intervention more targeted to his needs.

In the case of sportsmen, thanks to the PPG, the athletic trainer can know in advance whether the athlete is in a position to train effectively or if, on the contrary, he is at risk of over-training. The PPG is therefore useful in all activities that have an action on the person's regulatory systems and provides useful information to the therapist to objectively measure the effectiveness of his intervention.

SMAIRTHERO is another important step towards a healthier world. With SMAIRTHERO, users can be more proactive about their healthcare.

SMAIRTHERO makes you live in awareness!

Dr. Stefano Luzzago

Il Team



**MASSIMILIANO
GARRUZZO**
Head of Innovation



MAURIZIO CORAZZINI
UK Business Developer

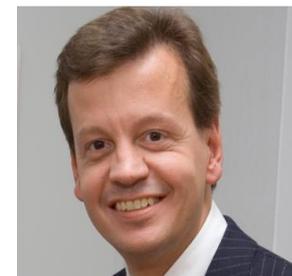


CELESTE GASPARRI
Digital Content Specialist

ILARIO SACCHI
CEO



OSVALDO BORDONI
General Manager



MARCO MATTESI
Commercial Director



SAVERIO LIPARI
CTO





SMARTHERO

KEEPING PEOPLE SAFE

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