75 bpm
18 rpm
142/90 mmHg
95 %

caducy

Smart health monitoring

by i-Virtual

Caducy emerges as a revolutionary solution for the **e-health** industry as it allows, in a world upset by a major health crisis, to comply with **social distancing**. In addition, Caducy allows to limit expenses related to the **sanitary measures** and the substitution of the accessories after each use

As a pioneer in **« contactless solutions »**, i-Virtual aims to provide the world of telemedicine with the technological bricks that are missing from its full integration into new lifestyles.

Its product, Caducy, is therefore of real interest to **prevent**, **diagnose** or to have a **follow-up of chronic diseases** by offering a simple solution, accessible to all and of medical grade accuracy.

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A PASSION: **INNOVATION**

Founded in 2014, i-Virtual is a start-up specializing in image and data processing for everyday health and well-being. Initially, *Professor Pruski*, whose research aims to help **people with autism**, joined forces with *PhD Moussaoui*, who is passionate about **algorithms**.

The merging of their knowledge and expertise has made it possible to develop an apprehending scenes model of everyday life through virtual reality. Because they wanted to adapt these simulations to **patient conditions**, such as stressful situations, they decided to develop a non-contact heart rate measurement tool: Caducy is born.

A **MULTIDISCIPLINARY** TEAM

The i-Virtual team is made up of around ten employees. This team is made up of **engineers** in computer vision, in artificial intelligence and in quality. But also, **researchers**, **PhD**, **developers** and a **sales and marketing team** under the responsibility of Gaël Constancin who took over the presidency of the company, in 2019.

Alain Pruski
Scientific advisor
Associate founder

Professor at the University of Lorraine, he specializes in cognitive stimulation and the fusion of data from physiological sensors.

He directed the **Laboratory of Automatics of Cooperative Systems (LACS)** specializing in computer science, automation engineering, electronics and neuroscience, and administered the Federative Institute for Research on Technical Aids for People with Disabilities (FIRTAPD).

Abdelhak Moussaoui
CTO
Associate founder

PhD in automation engineering, he is an **expert in algorithms, signal processing and optimization**.

A researcher at the University of Lorraine, he has created several companies in France and abroad in the field of 3D.

Gaël Constancin
President & CEO
Associate

Master Engineer with a Master in Business Administration from IAE in Bordeaux, he is also passionate about new technologies.

Entrepreneur for 12 years, he founded and managed two companies (Kubenboa and Cognityk).

PHYSIOLOGICAL VARIABLES MEASURED

Heart rate (HR)

Respiratory rate (RR)

Blood oxygen saturation (SpO2)
- Coming soon -

Blood pressure (BP)
- Coming soon -

Heart rate variability (HRV)

Stress level

A UNIQUE SYSTEM
IN EUROPE

Caducy is the first european system for measuring vital parameters **contactless** and operating with a **simple camera**. Thanks to Caducy, **telemedicine** solutions can now offer vital signs assessment in real time and so iron out certain **limits** of their online services.

This tool is the result of **5 years** of research and development. This is a **precise and robust** system. As a matter of fact, Caducy is composed of **unique algorithms** for stabilization, filtering and image processing developed by i-Virtual in order to make the system **less sensitive** to movements and fluctuations in lighting.

Used by several physiology research laboratories, Caducy is the subject of a **clinical study** on more than 1000 patients at the University Hospital of Nancy.

→ TO REMEMBER

Accurate contactless measurement of vital signs.

An **accessible** system by using **a simple webcam or camera** (PC, smartphone and tablet).

Robust against environmental disturbances

AN ADVANCED **TECHNOLOGY**

Caducy innovation is based on the combination of the most advanced techniques.

**Contactless
photoplestysmography
(Remote PPG)**

**Artificial
intelligence**

**Computer
vision**

**Signal
processing**

Photoplethysmography records the **light rays reflected** by oxygenated blood, which is transported in peripheral vessels. Due to a variation of the amount of oxygen with **blood flow**, there are modulations of reflected lights that occur. The collected periodic wave corresponds to **the pulse wave**, and the processing of this allows to deduce the instantaneous heart rate.

The **respiratory rate** is taken from the analysis of the movements of the **chest cavity**, which makes it possible to obtain a **very precise** and real-time value.

Added to **a new technology** derived from artificial intelligence, computer vision and based on the analysis of the PPG signal, the measurements of oxygen saturation (SpO2) and blood pressure can be extracted from the heart signal **without the need** for an oximeter or tensiometer.
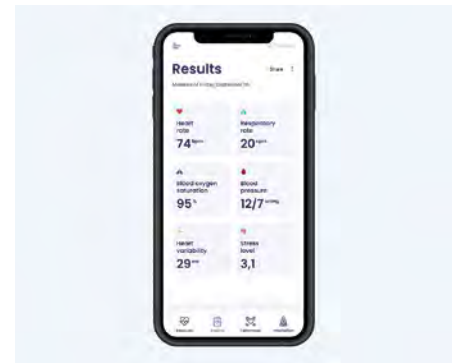
AN **INTUITIVE** TOOL

The ease of use of Caducy allows you to use it independently.
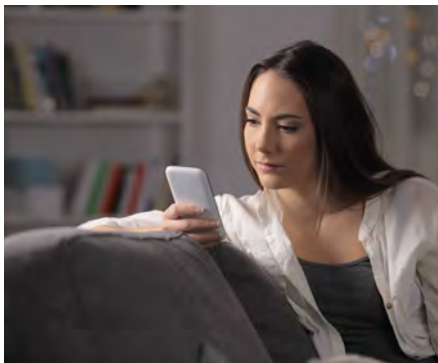
Just sit back
and relax.

Take a selfie for about
30 seconds to a minute.

Immediately check
your results.

MULTIPLE APPLICATION FORMATS AND USE CASES

Caducy is available on all computer devices and phones with a webcam, via a mobile application or directly integrated in white label in the form of a software library with API.

TELEMEDICINE

On the raise, telemedicine eases patients life and healthcare professionals, but it has limitations due to the lack of clinical examination.
In addition to providing a **solution to these platforms**, the omnipresence of cameras and their integration into computer devices (PCs, smartphones, tablets...) facilitate the use of Caducy while avoiding the purchase of medical equipment.

AT HOME FOLLOW-UP

Caducy helps the return of people who have had an outpatient operation to their home, or the follow up of elderly people at home. It has the advantages of not requiring any special equipment and of being intuitive: it is a **simple and autonomous** measurement of vital parameters. Once the measurement has been done, it can be sent to healthcare professionals.

HEALTH CENTERS

In health care facilities, vital parameters are measured by medical staff using devices with sensors in contact with the skin. In some situations, this type of **«contact»** device is complicated to install or use (severe burns, newborns, sterile rooms, certain surgeries, etc.). **What Caducy allows :**
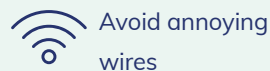
- Avoid annoying wires
- respect of the social distancing
- avoid contact with the skin
- avoiding virus transmission

caducy

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by i-Virtual

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✷GROUPE**GET**

Our partners: