



IN COLLABORAZIONE  
CON L'UNIVERSITÀ DI UDINE

## WHO WE ARE

Eppos srl is an innovative startup formed by a team of professionals with decades of experience in their sectors, already owner of international patents on technologies, software and algorithms.

**ROBERTO MICHIELI**

**MASSIMO BISAZZA**

**DENIS ERMACORA**

**MANUELE ORTIS**

**FRANCESCO NOT**

**NICOLA CARDIN**

**ALESSIO TROPPINA**

**SAIEE SRL**

**MODERNE TEHNOLOGIJE D.O.O.**

CEO

Technical manager

Researcher and developer

Mechanical designer

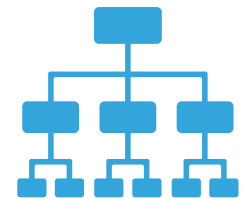
Electronic engineer

Electronic engineer

Business development

Automation partner

Robot application partner



## WHAT WE DO

Research, development, industrialization and installation of 2D and 3D vision systems, spectrophotometry and innovative sensors.

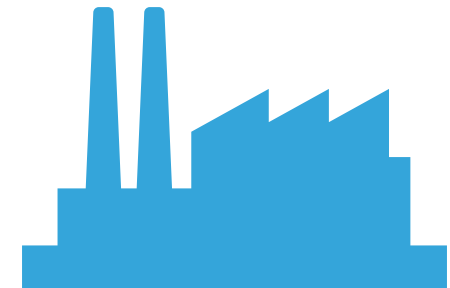
Tailor made vision systems

InLine vision systems

Spectrophotometer

3D bin picking robot guide

UWB Innovative sensors



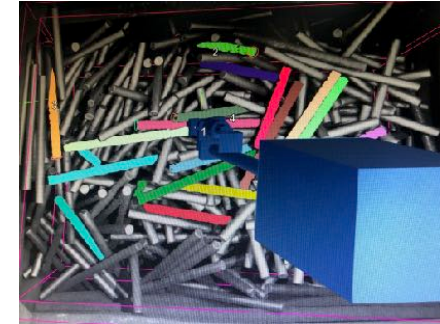
# SOME PROJECTS



Spectrometer / blood detection



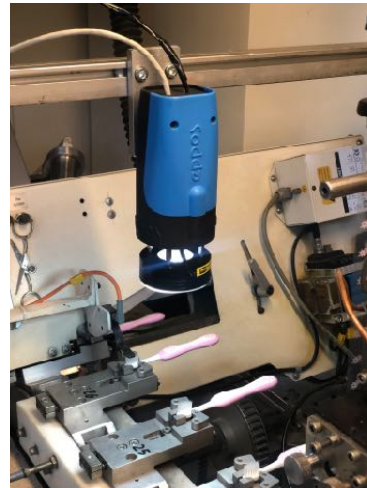
InLine control of eggs



3D bin picking



OffLine dimension control



InLine defects control



Hole detections



Proximity Alert



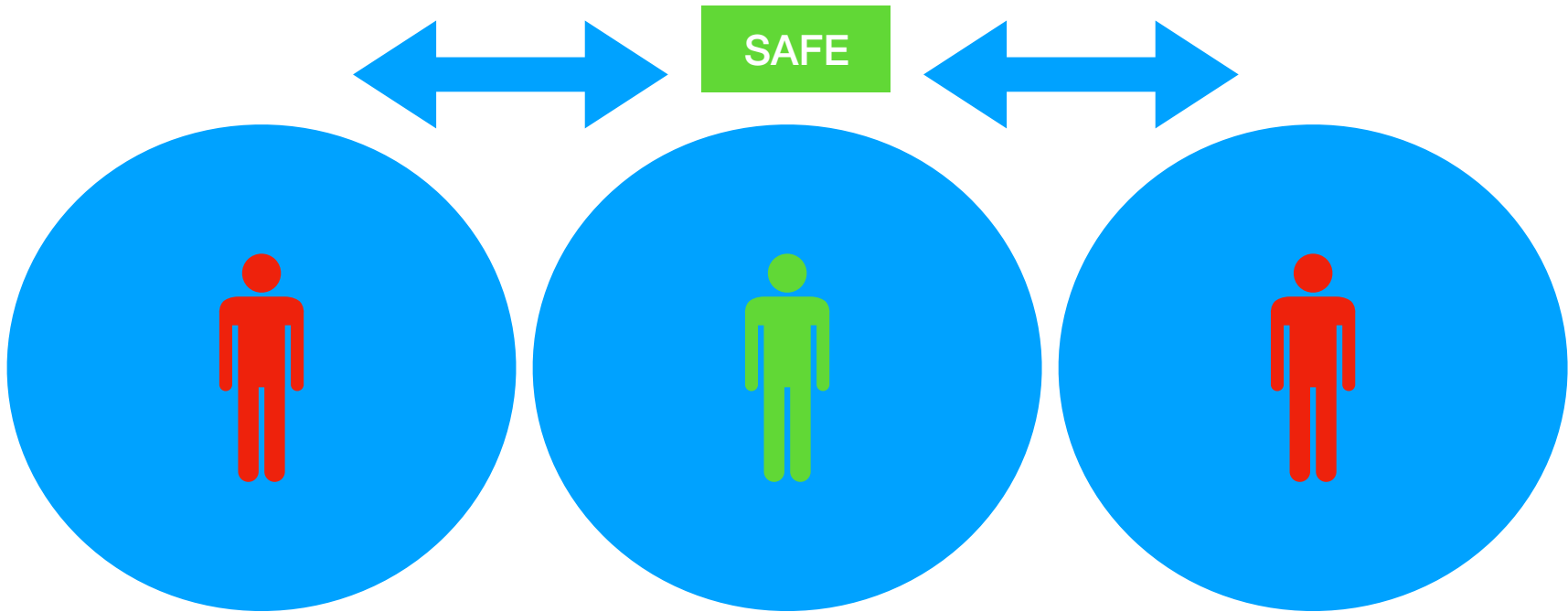


EPPOS

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# SAFETY DISTANCE



# SAFETY DISTANCE

- ▶ Spread of the virus is limited by **respecting a safety distance between people of at least one meter**
- ▶ Failure to comply with the obligations is punished by **Italian Penal Code**
- ▶ This safety distance is difficult to monitor, everything is left to the sensitivity of the staff itself, however this is not sufficient neither to guarantee the safety of workers nor to comply with **legal obligations**.
- ▶ Respect for the safety distance is also a priority for the employee himself who feels protected by the company.
- ▶ There is no any tool that allows staff to be alarmed if they get too close to another operator / user.



## PROXIMITY ALERT: STORY OF AN IDEA

Having multidisciplinary skills, speed of action, innovative development skills, at the beginning of March 2020 we confronted ourselves on a possible system to stem Covid-19 by exploiting our skills.

We had speculated:

- artificial vision system with recognition and tracking of people, viable but expensive solution and with the need for important infrastructure
- system based on Bluetooth communication, economic but impractical due to intrinsic limits of technology (very low precision)
- UWB-based system, innovative solution never tested for this type of application (normally used with antennas external to tags)

On March 31st we recorded the project on Innova For Italy:

Registration ID: 2194

Service title: Sensors and safety distance monitoring

today April 16th we are ready with the first prototypes

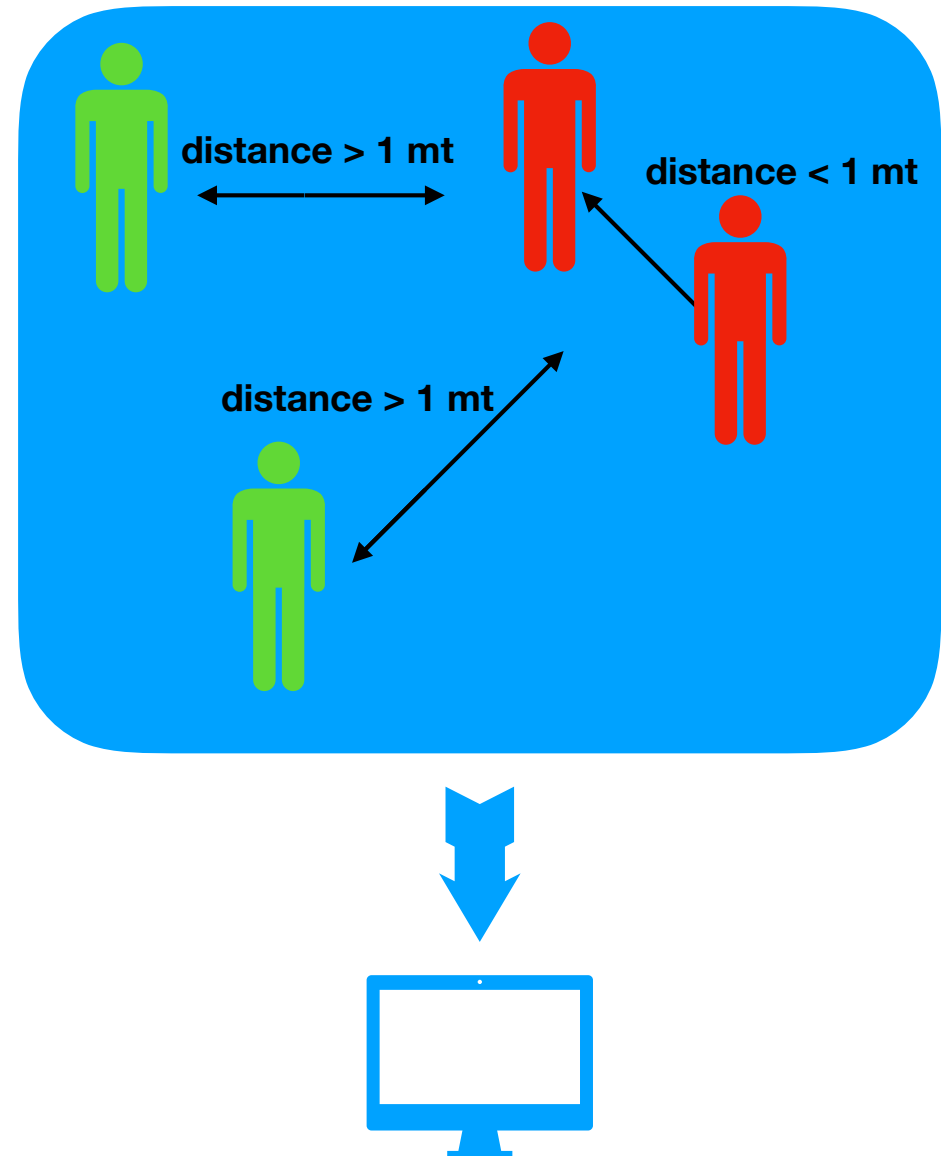


**Innova per l'Italia**

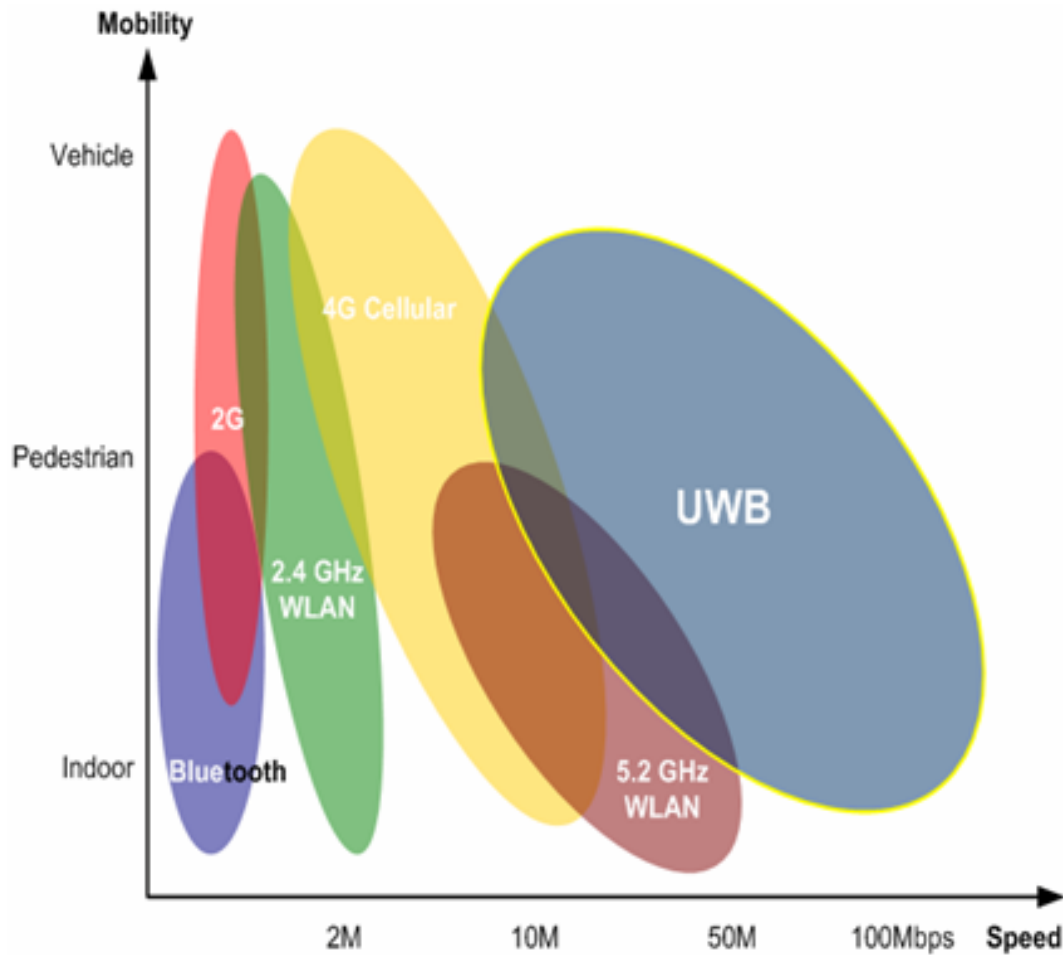


## SOLUTION: ALARM AND PROXIMITY MONITORING

- ▶ The system consists of a series of wearable sensors interconnected with each other via UWB technology, patent pending.
- ▶ If a sensor is located at a distance less than the safety distance (settable via software) it will emit an audible signal and a vibration.
- ▶ Accessory to the system is the data download on a centralized hub for statistical purposes



# UWB COMPARED WITH OTHER TECHNOLOGIES



## STANDARD FUNCTIONS WITHOUT INFRASTRUCTURE

- ▶ **Proximity Alert:** the sensor vibrates and sounds if it exceeds the set threshold for more than 2 seconds
- ▶ **Threshold setting:** the safety distance can be changed to adapt it to the legal provisions

## EXTRA FUNCTIONS

- ▶ **Family Team** allows you to set software families of sensors that are enabled to overcome the safety distance between them

## DATA MONITORING

- ▶ The system, by alerting users and possibly informing managers, will be able to maintain a high safety standard as prescribed by the WHO
- ▶ The system will be able to demonstrate that "everything possible" has been done to guarantee the safety allowing to keep the production sites and public premises operational
- ▶ Ideal to be used in case of meetings with persons that are not involved in normal operations of the company
- ▶ No sensitive data is stored by the sensor
- ▶ Downloading data to the centralized hub is an accessory and in any case anonymous function
- ▶ The daily data can be used for statistics, monitoring and prevention activities

# EXTRA FUNCTIONS WITH SINGLE POINT OF INFRASTRUCTURE

- ▶ **Daily download:** download of alarms datas from the sensores.
- ▶ **Database and statistics:** the alarm database creates a list of iterations in order to identify the contacts between users, thus being able to reconstruct, even later, the map of possible infections.





## EXTRA FUNCTIONS WITH DIFFUSED INFRASTRUCTURE

- ▶ **Alarm “man down”**: thanks to the integrated accelerometer, in the event of a fall, the system alerts the emergency and provides information on its search area.
- ▶ **Databases and statistics with areas of interaction**: the alarm database can be also integrated by indicating the area.
- ▶ **Zone attendance monitoring**: it is possible to identify the number of users present in a certain area and their identification

The diffuse infrastructure is a customization that by its nature must be agreed with the customer.

# TECHNOLOGY

The solution is based on wearable sensors with IoT and UWB technology capable of communicating with each other and downloading data in a centralized hub (accessory function).

Features:

- Sw to program the sensors with the required safety distance;
- Family Teams management of sensors enabled to approach beyond the safety distance
- customizable data and statistics collection (accessory function)
- Distance can be set from 0.5 to 10 meters
- Accuracy of +/- 20 cm
- weight less than 50 gr.

Eppos srl, already owner of some international patents, through its consultants and collaborators, is able to produce the first prototypes by the end of April.

## IDEAL SOLUTION FOR

- ▶ **Industry:** it guarantees the respect of the safety distance between the workers
- ▶ **Public places:** with the Family Team function it allows you to manage groups of families;

## IT CAN

- ▶ **demonstrate** to the control bodies that "everything possible" has been done to guarantee the safety of the staff allowing to keep the production sites and public premises operational
- ▶ **ensure a healthy, safe and efficient** working environment by reducing the risk of infection
- ▶ **manage the emergency** anonymously and without sensitive data

# COMPARISON WITH OTHER TECHNOLOGIES

## BLUETOOTH

- ▶ **Inaccurate:** estimating the distance based on the signal strength, the measurement has important uncertainties of the order of several meters, therefore it cannot be used for this application
- ▶ **Limited:** even using external infrastructures, there is an intrinsic limit in technology that cannot guarantee coverage of large areas;

## UWB WITH EXTERNAL ANCHOR

- ▶ **Unreliable:** although it is excellent in free spaces, it is presumable that shadow areas where the signal does not arrive occur in areas with obstacles, in these areas the sensors would not be active;
- ▶ **Expensive:** even admitting to covering all areas, the infrastructure for simple use tracking of safety distance monitoring would have costs that are difficult to justify;
- ▶ **Slow:** the time required to update the data (triangulation) makes the solution unsuitable for this application.

# PRIVACY

- ▶ The sensors are anonymous, they have a unique UIDD;
- ▶ The stored data are anonymous, they can be associated to the user, even later, directly by the customer in accordance with the rules relating to corporate privacy.



# CERTIFICATION

- ▶ The product is supplied with CE marking;
- ▶ Compliant with EMC according to ETSI EN302065-2 and EN55032: 2015 standards;
- ▶ Test report compliant with EN 55024: 2010

