



NeaPolis Innovation TECHNOLOGY DAY 2022

23 novembre, 09.30 - 14.00 Via Remo De Feo 1 | Arzano | 80022 (NA)



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23.11.2022



BMS - Battery Management System

A **ELONCIN** COMPANY

OWNER

https://www.cmdengine.com/



APPLICATION FIELDS

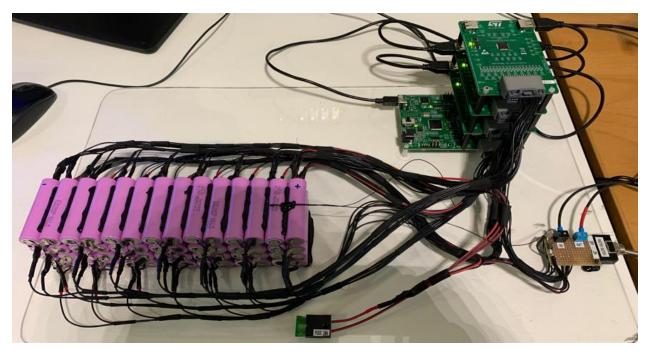
e-Bike, Automotive, Hybrid Power Train for Marine application, Hybrid application in General Aviation.

KEY SELLING POINT

- Modular
- Accuracy of the SoC and SoH estimation.
- CMD capability to certify the SW and HW for General Aviation application

STAKEHOLDERS

- Battery Pack manufacturer
- e-bike manufacturer



Battery Management System (BMS) is technology dedicated to the supervision of a battery pack, which is an assembly of battery cells, electrically organized in a row x column matrix configuration to enable delivery of targeted range of voltage and current for a duration of time suitable for the expected load scenarios.

It estimates the SoC (State of Charge) and SoH (State of Health) of battery pack based on Kalman filter in order to increase battery life and efficiency.

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cogitoprediction.com



APPLICATION FIELDS

Smart industries, naval logistics, submersible pumps.

KEY SELLING POINT

- Safety
- Non invasive
- Maintenance efficiency

STAKEHOLDERS

- Control System Designer
- Industry
- Logistics
- Aqueducts and sewer management companies





Cassandra aims to predict electrical motor failures by means of powerline signals.

Cassandra observes the power signals of the electric motors and is able to prevent safety hazards such as fires, short circuits, downtime, etc. The device is composed by multiple sensors for the tree-phase power supply sampling and several peripherals for managing the acquired data.

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IoT Modules

OWNER

http://www.radiocontrolli.com



APPLICATION FIELDS

Wireless Module, IoT Modules

KEY SELLING POINT

- Time to market reduction
- Easy to use
- CE/FCC Certification
- Custom design

STAKEHOLDERS

- Home Automation, IoT System, Wireless Sensor Network
- System Integrator



Lora Wireless Module STM32WLE5JC based

RC-WLE5-868 is an ultra low pow er long range device designed by RadioControlli. The module is based on STM32WLE5JC device from STMicroelectronics. Multiprotocol LPWAN 32bit Arm®Cortex® M4 MCUs, LoRa®, (G)FSK, (G)MSK, BPSK . The main applications of this module are Internet of Things devices and wireless sensor networks, especially battery pow ered low pow er consumption long range.

CORE : STM32WLE5JC Operative Frequency bands : 868MHz. Ready for use SMD mounting (13 x 14.5mm) Metal shield.

Transceiver Modules S2LP based

Standard Version RC-S2LP-XXX

- Available at the frequency 433/868/915MHz
- CE/FCC Certified
- 868/915MHz versions available with Helical Antenna.

SPIRIT2 Version RC-SPIRIT2-XXX

- Available at the frequency 433/968MHz
- CE Certified
- Available versions with pad antenna.
 (Pin to Pin compatible with SPSGRFC modules)





CONNECTID SCAN

OWNER

http://www.sensorid.it



APPLICATION FIELDS

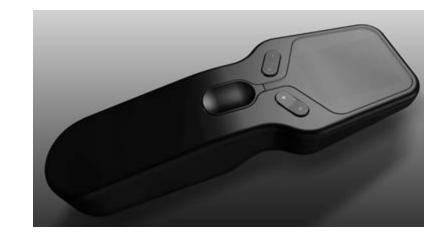
Logistic; Retail

KEY SELLING POINT

- Low cost
- Easy to use
- Direct integration with cloud SDK

STAKEHOLDERS

- Logistic
- Retail



Operational Features:

- Full web based SDK that allows to addressed all functionalities of device
- Data synchronization with cloud middleware to exchange data with web app and web services
- Data synchronization with cloud middleware to exchange data with the management platform
- Capability of filtering multiple readings with optimized algorithm using FLASH memory
- Capability of filtering tag with a defined prefix
- Capability of storage of data collected during inventory or receiving
- Capability to load in memory a list of tag to be checked during inventory

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OWNER

http://www.sensorid.it



APPLICATION FIELDS

Tracking

KEY SELLING POINT

- Low cost
- Easy to use
- Direct integration with cloud SDK

STAKEHOLDERS

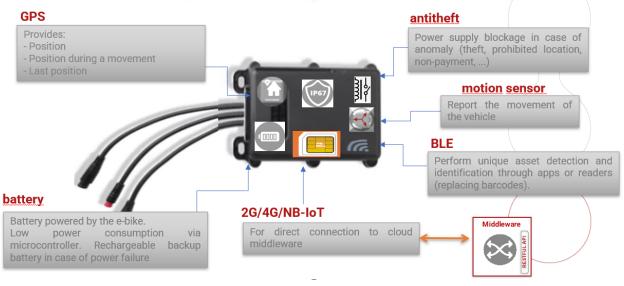
Mobility sharing

TRACK ID



E-bike device

is an external device, attachable to the body of the e-bike to be tracked / located



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OWNER

http://www.topview.it



APPLICATION FIELDS

UAS, Ultralight aircraft

KEY SELLING POINT

- Lightweight and compact
- Ready to use
- Track your UAS on d-flight
- Advanced U-space services

STAKEHOLDERS

- UAS Pilots
- UAS Operators
- U-space Service Providers
- UAS Operators' customers



Pollicino is a drone tracker based on 4G NB-lot and GNSS technologies, which implements remote identification service via network.

Featuring small size and easy installation, it allows to send the position information of the UAS during the flight (visualizing operator code, position, altitude, ground speed of the UAS on d-flight platform) and to enable simple and safe access to U-space services.

Hassisto

CardioHome

OWNER

https://www.hassisto.com



APPLICATION FIELDS

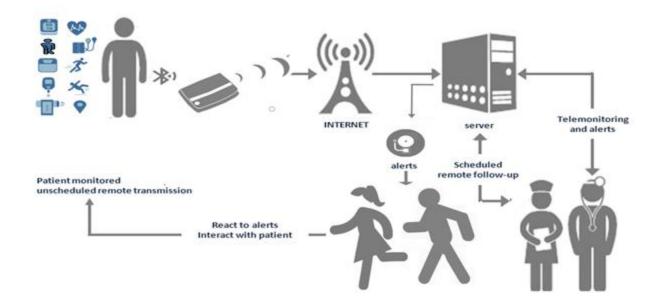
eHealth home rehabilitation for cardiopatics

KEY SELLING POINT

- Low cost
- · Easy to use
- Modular
- Profitable for rehabilitation treatments

STAKEHOLDERS

- Rehabilitation center
- Clinics
- Nursery companies



CardioHome in an eHealth platform that allows to have rehabilitation exercises in the comfort of your home with the supervision of your physiotherapist.

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Augmented Reality Smart Glass for Industry 4.0

YOUBIQUO

OWNER

www.youbiquo.eu



APPLICATION FIELDS

- Smart Manufacturing
- Remote Assistance
- Quality

KEY SELLING POINT

• Hands-free device

• Open architecture

- Easy to use
- Fingerprint Sensor on board
- Long life battery

STAKEHOLDERS

- Industry 4.0
- Maintenance sector
- System Integrators





Holo Industry+ is a Smart Glasses specifically designed for maintenance operations and production procedures.

The AR Smart Glass ensures enhanced security due to a fingerprint sensor on board.

Remote assistance and guidance to train, record and certify maintenance operations is allowed by shared vision/video call through high-res camera.



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PPVM – Predictive PhotoVoltaic Management

OWNER

http://www.epowering.it



APPLICATION FIELDS

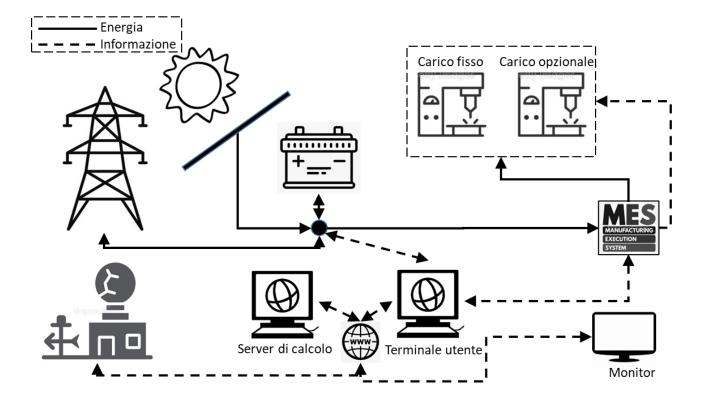
Smart energy, smart home, smart cities, industry 4.0

KEY SELLING POINT

- Energy optimization
- Sustainability
- Emissions reduction
- Smart automotive charging stations

STAKEHOLDERS

- Industry
- Automotive charging infrastructure
- Energy communities



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Start To SAT

OWNER

www.dambrosrobotics.it



APPLICATION FIELDS

Environmental Monitoring, Training on STEM disciplines, Scientific and Engineering experimentations,

KEY SELLING POINT

- Durable yet lightweight thanks to its 3D printed structure
- Modular, easily expandable and upgradeable
- · Possibility of carrying out scientific experiments on board

STAKEHOLDERS

- High school
- University
- Training Centers



Start To Sat's goal is to have a small satellite built in schools and then launched into the stratosphere for environmental monitoring and small scientific experiments. Start To Sat is designed as an open source assemblable modular kit that has an STM32F401RE Core Board as its motor and can be equipped with the desired sensors, actuators and communication boards.

The project follows in the footsteps of the Cubesat miniaturized satellite developed since 1999 by the Polytechnic University of California and Stanford.

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Swiss Airtainer Control System (SCS) In-Flight Detector (IFD)

OWNER

http://www.bestengineering.it



APPLICATION FIELDS

IoT controller for RKN refrigerated container.

KEY SELLING POINT

- Low cost
- Low power
- Complete with a Real-time IoT system, two-way communications with data integrity, timestamps and full traceability

STAKEHOLDERS

- Cold chain
- Pharmaceutical market
- Logistic market



The SCS consists of an embedded Controller Module placed in the Temperature Controlled Container Equipment Bay. It will control an HMI, Temperature Control System, Energy Power System, In-Flight Detector, BLE module, sensor BUS (T, H, Shock, ToF), GPS, 4G.

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Seafloor monitoring

OWNER

http://lesim1.ing.unisannio.it/



APPLICATION FIELDS

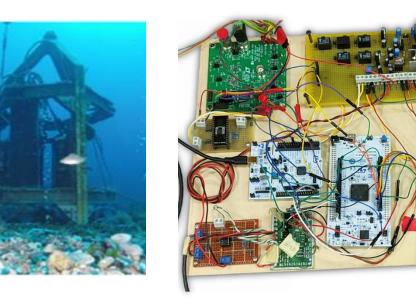
Underwater environmental monitoring Seafloor observatories

KEY SELLING POINT

- Low-power
- Modular
- High-speed data acquisition
- Turn on/off each sensor for power-saving/reliability

STAKEHOLDERS

- Sea research and protection agencies and institutions
- Sea Industry



The prototype consists of a flexible, robust and low-power data acquisition system for multidisciplinary underwater monitoring. It consists of a data acquisition system for hydrothermal sites, with the following features:

- One high-speed channel for acquiring hydrophone signals, to monitor hydrothermal vent noise, or anthropic noise;
- 8 to 16 configurable analog channels to be used with 0-5 V voltage-output sensors, or AD590KH current-output temperature sensors;
- Digital sensors with UART interface (e.g. gas concentration sensors, water current sensor, Conductivity-Temperature-Depth sensor).

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UniNa Corse Combustion&Driverless

OWNER

https://cteam.uninacorse.com/



APPLICATION FIELDS

Automotive, Autonomous vehicles

KEY SELLING POINT

Key word: innovation. UniNa Corse wants to follow the advancement of technology, namely self-driving vehicle.

The team is looking for companies interested in investing in the future, in innovation, in a team of young talents willing to get involved and implement their knowledge.

STAKEHOLDERS

- Industry
- University
- Automotive market
- Autonomous vehicle market



UniNa Corse Combustion&Driverless is a team of the Federico II University of Naples that competes in the Formula Student competition with a racing car entirely built by the engineers of the team.

The UC22DV1 is the first self-driving vehicle in southern Italy and one of the first in southern Europe.

Driverless is the future and UniNa Corse wants to be part of it.

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Università degli Studi di Napoli PARTHENOPE

OWNER

Laboratorio di Meccanica del Volo Dipartimento di Scienze e Tecnologie https://www.scienzeetecnologie.uniparthenope.it



APPLICATION FIELDS

- Guidance, Navigation and Control of Unmanned Aerial Vehicles
- Rapid prototyping of Flight Control Systems
- Inertial Navigation System development

KEY SELLING POINT

- Higher accuracy with respect to typical home-made calibration ٠
- Useful to test attitude estimation algorithms in dynamic motion ٠
- Low cost, easy to build
- **3D** Printed

STAKEHOLDERS

- UAV industry and Industry 4.0
- Model aircraft developers and operators
- University, Research centers

Automatic Calibration System for low-cost IMU sensors

Laboratory Activities:

- UAV design & development
- Guidance, Navigation & Control of novel UAV configurations
- Design of digital twins for advanced simulation of UAV operative scenarios



The calibration of low-cost Inertial Measurement Units (IMU) is a fundamental stage towards the implementation of a drone control system. Usually, it is carried out by hand, resulting rough and poorly accurate, with uncertainties in the final calibration.

This system, based on three axes moved by accurate servomotors can automatically calibrate different IMU sensors:

- accelerometer
- gyroscope
- magnetometer

Using optical encoders to ensure an angle resolution below 0.1°.

We used the ST Nucleo G431KB board.



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ETLCLab Research Group

OWNER

https://etlclab.poliba.it

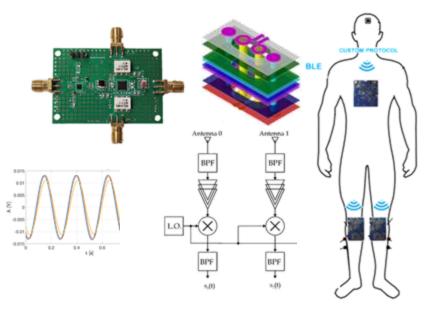


APPLICATION FIELDS

- RF electronics
- Embedded and Digital Systems design
- Internet of Medical Things (IoMT)
- Indoor and outdoor localization and navigation systems
- Industry 4.0

STAKEHOLDERS

- Universities
- Research centers
- Industrial spin-offs from universities (technology transfer)



Electronics for Telecommunications Laboratory (**ETLCLab**) is a research and didactic laboratory of **Politecnico di Bari**. The focus is put on studying, designing and deploying innovative electronic systems for telecommunications operating at **high frequencies**.

Main research fields involve RF electronic systems, Internet of Things (IoT) and Internet of Medical Things (IoMT), indoor and outdoor navigation systems and Industry 4.0.

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AFFILIATION

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APPLICATION FIELDS

- Smart metering for energy management
- Telehealth

KEY POINT

- Measurement
- Real-time system
- Digital Signal Processing
- A/D conversion
- Internet of Things
- Biomedical engineering

STAKEHOLDERS

- Energy managers, energy distributors, energy customers
- Healthcare industries, medical services, hospitals

Single-phase wattmeter

 Wattmeter
 Implement

 V rms [V] = 2.69
 P [W] = 0.30

 I rms [I] = 0.12
 Q [var] = 0.14

 S [VA] = 0.33
 and widdesign within the measure

Implementation of a single-phase wattmeter. The instrument is based on a STM32F746NG demo board, that is equipped with an ARM CORTEX M7 core, operating up to 216 MHz and with three 12bit ADCs. The device was designed and programmed in C by students within the academic course of the "embedded measurement systems".



Wearable ECG recorder

HUG YOU recorder is a heart monitoring device.

It allows for:

- Real-time monitoring of arrhythmias during video visits
- Easy and self-guided holter ECG monitoring
- Recording on your own 12-lead ECG
- 24-bit @ 400 Hz or 16-bit @1000 Hz
- BLE 5.2 based on STM32WB55 µC
- IoT-cloud based medical service



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Embedded Systems a.a. 2021/22

OWNER

http://mivia.unisa.it https://www.diem.unisa.it/



APPLICATION FIELDS

Real-time embedded systems, consumers, machine learning

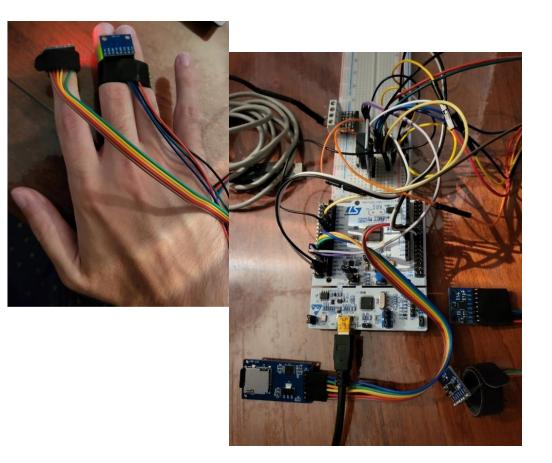
.DIEM

KEY SELLING POINT

- DIY
- Embedded Machine Learning
- Educational projects

STAKEHOLDERS

- Education
- Students



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STM32 Based Projects Electronic Students UniNA

OWNER

Corsi di studio triennale e magistrale in Ingegneria Elettronica - UniNA <u>http://www.ingegneria-elettronica.unina.it/</u>



APPLICATION FIELDS

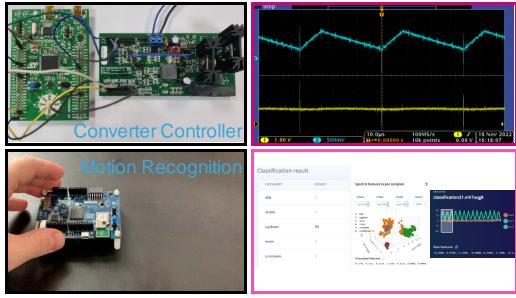
Power Electronics; DC-DC Converter; Open-Source Electronic Projects; Motion Recognition; IoT; Machine Learning.

KEY SELLING POINT

- Easy to use
- Low power
- Artificial Intelligence
- Smart wireless sensors

STAKEHOLDERS

- Universities & Research Centres
- Industry
- Medical, Energy and PV fields
- Entertainment



Digital Power Buck Converter Controller: PWM pattern generator for controlling 18W DC-DC converter. The control logic based on a double feedback loop is implemented on STM32F303 MCU. EDGE-AI: Different project built for STM32L4 IoT node MCU. (i) Continuous Motion Recognition; (ii) Recognize sounds from audio; (iii) Responding to your voice.

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T mini pong

OWNER

https://stminipong.giocomune.com



APPLICATION FIELDS

Gaming and entertainment. Handheld console configuration.

KEY SELLING POINT

- Game coded from scratch
- Minimalistic design for portable use
- Faithful recreation of a classic game
- Local multiplayer

STAKEHOLDERS

- Retro gaming stores
- Arcade rooms
- Vintage collectors

StMiniPong



This project is a recreation of the classic game «Pong». It features a local multiplayer experience with an additional scoreboard display and sound effects, all built into a miniature portable arcade cabinet.

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flugantia

OWNER

https://www.progettorigel.it/



APPLICATION FIELDS

Smart Manufacturing & Maintenance, Smart Supply Chain Management, Production Planning, Waste Management, Industrial scenarios

KEY SELLING POINT

- Iot, Artificial Intelligence, Big Data & Analytics
- Flexible and quickly verticalized device
- Global connectivity
- Large set of collected and transmitted data

STAKEHOLDERS

- Waste collection and waste management companies
- Industry
- Logistics companies





RIGEL is a roll-off container monitoring system based on Industrial Internet of Things (IIoT): it consists of a set of sensors and processors for the detection of different parameters, a firmware and a web software part based on AI for processing and displaying the collected data.



Autonomous Cart for Battery Swapping

OWNER

http://www.teoresigroup.com/it/insight/xev-autonomous-vehiclestory/xev-paris-motorshow2022 https://www.teoresigroup.com/activities/partnership/stmicroelectro nics/#autonomouscart

APPLICATION FIELDS

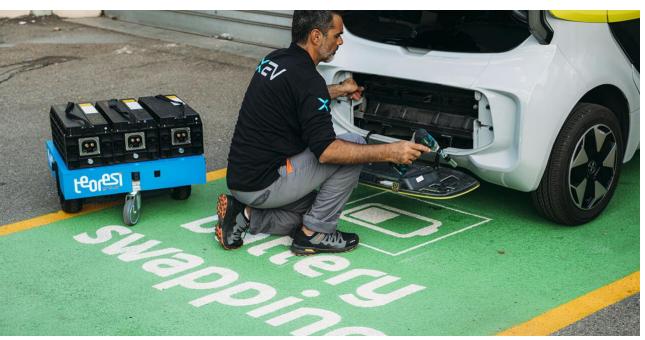
Smart cities, Smart logistic, Charging station

KEY SELLING POINT

- Modular
- Easy Customization
- Carrying heavy objects
- Connected

STAKEHOLDERS

- Automotive, Industrial and Railway OEM
- Telco Companies
- Logistic Factories
- E-Solution Market





Presented on Paris Motorshow 2022

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Real-Time SoC and SoH Estimation through Neural Network

OWNER

http://www.teoresigroup.com

https://www.teoresigroup.com/solutions/powertrain/#b atterymanagement

APPLICATION FIELDS

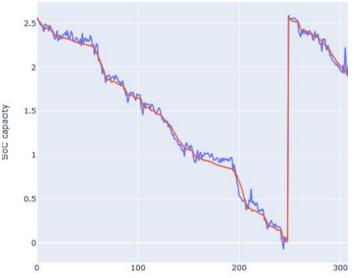
Battery Management Systems, Energy Management

KEY SELLING POINT

- Real-Time data acquisition
- High customizability
- Battery architecture independent

Image: Construction of the second se

Results on testing



STAKEHOLDERS

- Automotive, Industrial and Railway OEM
- E-Solution Market

CHORUS SP58EC80ES ST Board

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Android Auto Connectivity System

OWNER

http://www.teoresigroup.com

https://www.teoresigroup.com/solutions/hmi

APPLICATION FIELDS

Human Machine Interfaces Cluster and Infotainment

KEY SELLING POINT

- High customizability
- Rapid Prototyping of the interface
- Connectivity with different devices
- Available for different ST Boards

STAKEHOLDERS

- Automotive, Industrial and Railway OEM
- E-Solution Market



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SMART SCHOOL FOR HEALTHIER CLASSROOMS

OWNER

https://www.facebook.com/104526891786938/posts/1049 40915078869/?d=n



APPLICATION FIELDS

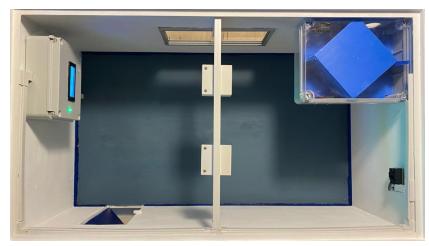
Smart home

KEY SELLING POINT

- Low cost
- Easy to install, configure and use
- Cloud management

STAKEHOLDERS

- Electronic Industry
- School
- Building Automation





Air quality has always been a fundamental issue for all environments: indoors and outdoors and for any intended use. The Smart School for Healthier Classrooms project aims to create a low architectural impact solution based on an IoT architecture to measure and manage the IAQ conditions through a system which, using appropriate sensors, allows to detect the values of concentration of some contaminants that are often present in school environments and not only and, in case of exceeding the thresholds indicated by the standards, activate a Dual Flow CMV. The system is modular and scalable and can be integrated into a cloud data analysis system

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OWNER

https://www.isismarcianise.edu.it/fe rraris_buccini/



APPLICATION FIELDS

Smart Seaweed Cultivation Sea water regeneration

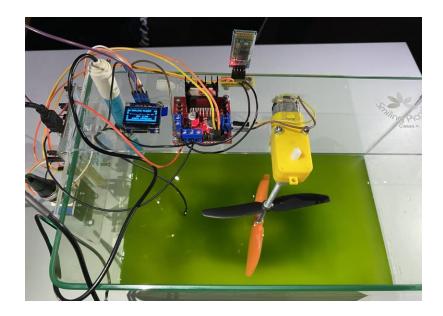
KEY SELLING POINT

- Low cost
- Easy to use

STAKEHOLDERS

- Industriale
- Aghicoltura
- Casalingo

Smiling Planet



- Smiling Planet è un sistema capace di rilevare un'anomalia dei parametri vitali dell'ambiente in cui viene coltivata l' Alga Clorella che purifica I ambiente, è antiossidante e libera il corpo umano dai metalli pesanti.
- I dati raccolti vengono inviati all'app accessibile permettendo di monitorare anche a distanza il sistema.

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https://www.bluenetita.com



APPLICATION FIELDS

The **Visible Secure Identification Document** (ViS-ID) Is a cost-efficient security mechanism for identity documents Which does not rely on difficult to procure microchip

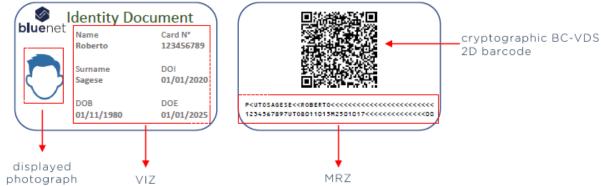
KEY SELLING POINT

- Low cost
- · Easy to use
- Digital signature (PKI)
- Blockchain technology

STAKEHOLDERS

- Public Administration
- Government National Printing house
- elD market
- Secure paper document storage





Typically, the **displayed photograph**, **Visual Inspection Zone** (VIZ) and **Machine-Readable Zone** (MRZ) of the document are encoded into **ViS-ID** templates and incorporated into the cryptographic **BC-VDS**.



The BC-VDS can be generated using either standard 2D barcodes (QR Code, Data Matrix, Aztec, etc.) or if a greater data density is required the **Bluecode High Density Matrix (BC-HDM)**, which can encode up to 10 KB of data, can be used.

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CHIBILOGIC

Chibilearn



Chibilogic http://www.chibilogic.com/



APPLICATION FIELDS

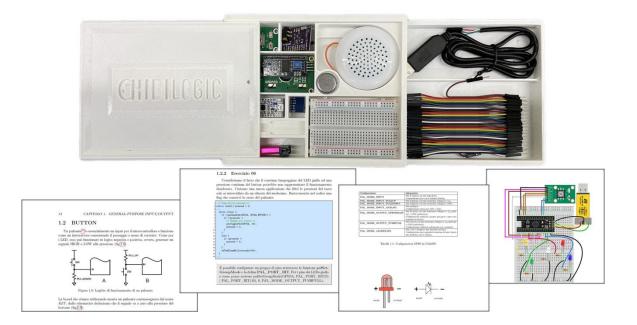
School Entertainment

KEY SELLING POINT

- Instruction book
- Easy to use
- Hardware components
- Transportable

STAKEHOLDERS

- Student
- Teacher
- Hobbyist



The Chibilearn is addressed to novices of the ChibiOS platform interested in learning in less time how to program with ChibiOS.

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CHIBILOGIC

OWNER

Chibilogic http://www.chibilogic.com/

APPLICATION FIELDS

Audio Entertainment

KEY SELLING POINT

- Compact
- · Easy to use
- Low cost
- Transportable

STAKEHOLDERS

- Performer
- Musician
- Wheelchairuser musician

Smart Guitar



The All-In-One-Guitar has all features which musician needs for playing. Switching among different presets is controlled through guitar movements.

through guitar movements. Tuner and Charge Battery functions are called by user button. Guitar sound is sent both output jack and Bluetooth module.

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VR Cultural Experiences

OWNER

www.culturaimmersiva.it



APPLICATION FIELDS

Culture, Education, Marketing

KEY SELLING POINT

- Unique VR Experiences
- Cheapest production costs
- 80% increase of customer retention
- 10.000+ satisfied clients

STAKEHOLDERS

- Cultural Sites
- Museums
- Schools
- Companies (es. for marketing)



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Interactive totem

OWNER

Electronic & Information Technology (Electroinfo) https://www.electroinfo.it



APPLICATION FIELDS

Events and congresses, Exhibitions, Smart home

KEY SELLING POINT

- Low cost
- Easy to install
- Hygienic
- Customizable

STAKEHOLDERS

- 3D Industry
- Gamification
- Entertainment providers



This interactive totem uses a sensor capable of seeing the position of the hands and fingers in space without the aid of a touch screen.

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