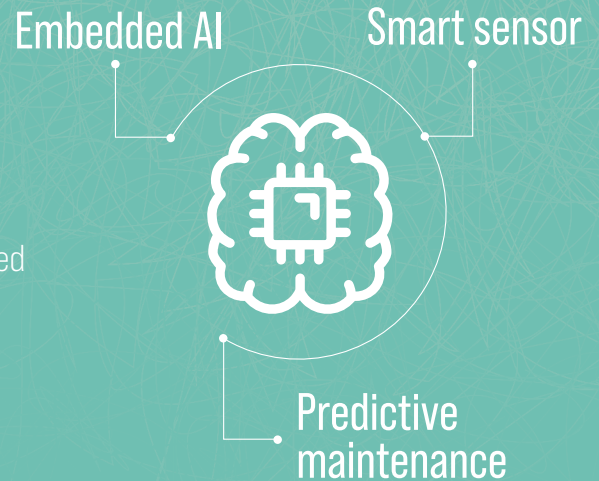# SMART EMBEDDED SYSTEMS

Embedded intelligence for predictive maintenance, proactive hypervision and autonomous monitoring.

AN ALTEN – STMICROELECTRONICS JOINT OFFER

ALTEN & STMicroelectronics have joined forces to boost your Smart IoT deployment on a large scale. These embedded systems perform automated missions, give contextualized alerts and provide high added-value services.

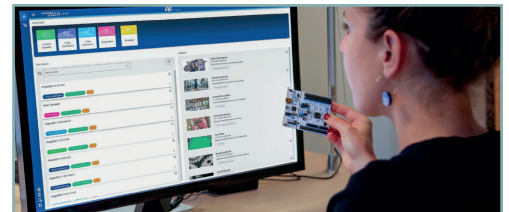Embedded AI

Smart sensor

Predictive maintenance

NANOEDGE AI STUDIO

Development tool to quickly deploy Machine Learning into high-tech devices.

Complete solution to integrate Machine Learning capabilities into STM32-based devices in a quick, easy, and cost-effective way.

NanoEdge AI Studio is a Machine Learning tool, which allows users to bring true innovation to their design. In just a few steps, developers can automatically generate an optimized Machine Learning library for their Edge AI solutions, based on a minimal amount of data.

KEY FEATURES & BENEFITS

- Train & infer directly on the target
- No need to send data to the cloud
- Create ready-to-use optimized models
- Reduce cost and leadtime: benchmark millions of ML algorithm combinations in minutes
- Generate optimized anomaly detection, classification and extrapolation libraries without any AI expertise

KEY APPLICATIONS

- Manufacturing predictive maintenance
- Home appliances anomaly detection
- Human detection
- Motor control condition monitoring

SIEMENS

life.augmented

ALTEN

END-TO-END ALTEN SUPPORT, CUSTOMIZED TO CUSTOMERS CHALLENGES

ALTEN support from exploration, needs definition, production launch to customer support.

OUR OFFERS

Level 1: START

Prerequisites: None

NanoEdge AI Starter Kit
(Software and Hardware)

Support:

· Setup
· Definition of business challenge
· Proof of concept (POC) for a use case

Level 2: BOOST

Prerequisites: Concept validated

Smart IoT Prototyping Kit

Support:

· Definition of specifications for Minimum
  Viable Product (MVP)
· Proof of value (POV) for a prototype
  to evaluate ROI

Level 3: RUN

Prerequisites: POC or POV validated

Solution industrialization

Support:

· Industrialization plan
· Architecture of the solution
· Deployment plan
· Change management

Level 3 Maintenance

OUR TRAININGS

1

Beginner training
on NanoEdge AI Studio

2

Technology transfer
for prototyping

3

Technology transfer
for industrialization and level 1 & 2
maintenance

ALTEN SUPPORT ON THE SOLUTION IMPLEMENTATION

Audit	Sensor & AI Prototyping	Data intelligence	Deployment
· Capture business objectives and operational requirements	· Sensor prototyping and algorithmic learning (AI)	· Realization of control tower and customization of dashboards	· Scaling up according to specifications and constraints
· Definition of input data	· Test dataset creation	· Settings definition of alerts and hypervisor	· Support solution integration into business process
· Definition of the technical solution customized to the customer environment	· Field test and machine learning campaign	· Software development	· Training deployment
· Configuration creation of the AI (Software) and IoT (Hardware)	· Models validation		

TO GO FURTHER (STMICROELECTRONICS X ALTEN X SIEMENS DI)

1/ AWARD-WINNING TECHNOLOGY

NanoEdge AI Studio enjoys international recognition (2019 IoT Solutions Awards & 2019 Best Innovative Technology award).

More recently, version 3.1 won Software category award from Embedded World 2022.
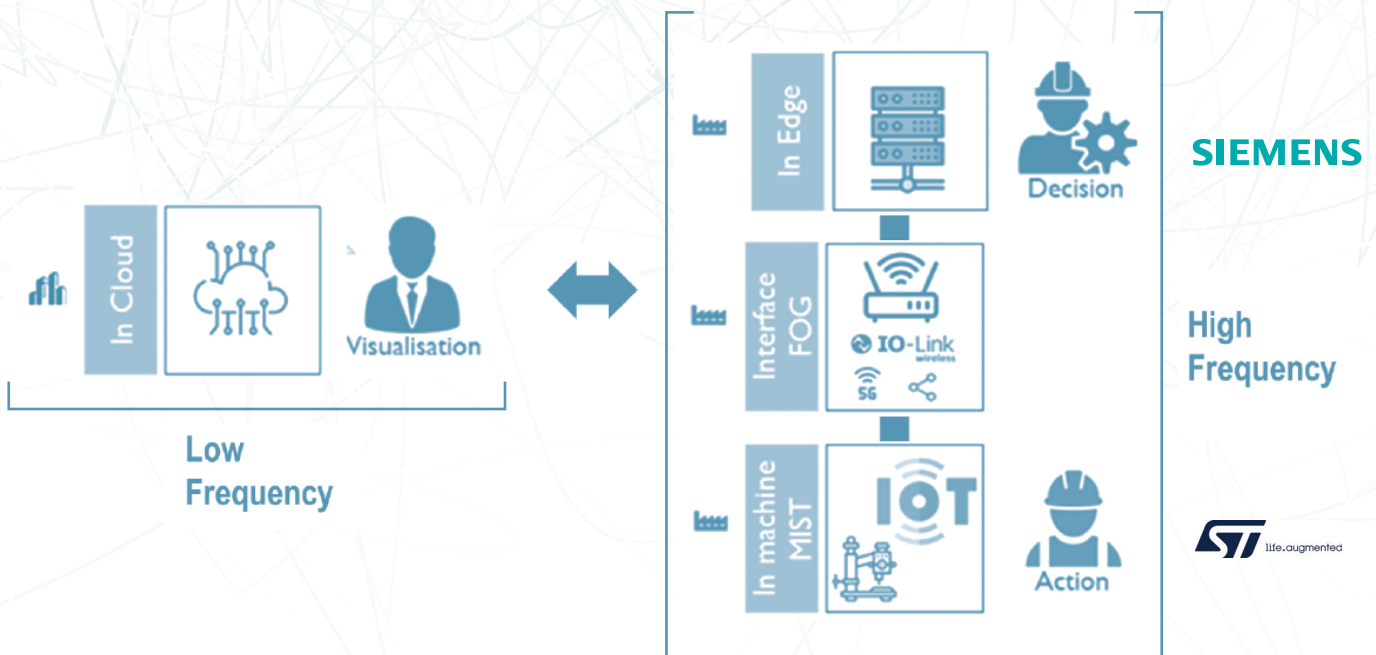
This technology is full of innovations allowing to deploy Machine Learning solutions on STM32 MCU based on Cortex M with the possibility of managing the learning directly into the microcontroller despite the strong Flash and RAM constraints.

2 /FROM SMART SENSOR TO SMART SYSTEM

As part of the predictive maintenance of cutting tools for an aeronautical player, we were able to develop a smart sensor to directly process the physical effects of the machine to predict drifts and thus prescriptive maintenance actions.
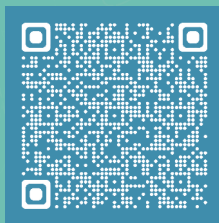
Use of embedded AI to process high-frequency vibration data (STM32 NanoEdge AI) correlated with real-time data from the factory (Edge computing SIEMENS DI CS) has made it possible to increase the lifetime of cutting tools by up to 30% and to avoid production disruptions.

Green IoT project « EcoIoT4.0 » : Ecodesign of an intelligent sensor for predictive maintenance
ALTEN selected by ADEME within PERFECTO 2022 call for projects, in partnership with SIEMENS DI CS and GREENSPECTOR

ALTEN supports its customers' development strategies in the areas of innovation, R&D and technological information systems.
Created more than 30 years ago, the Group has established itself as a world leader in Engineering and IT Services. Based in 30 countries, **ALTEN** currently has more than 54,100 employees all over the world.

ALTEN

LEARN MORE ABOUT OUR OFFER

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