Product brief

Predictive Maintenance

ARTIFICIAL INTELLIGENCE

Tessolve's Predictive Maintenance (hereafter referred to as PM) is an AI-based use-case to check the abnormality in the motor using an accelerometer sensor on machines using the Nanoedge AI library. Nano edge library is an Artificial Intelligence (AI) static library used to develop embedded C software running on ARM Cortex microcontrollers

When embedded on microcontrollers, it gives them the ability to easily "learn" and "understand" sensor patterns, by themselves, without the need of the user to have additional skills in Mathematics, Machine Learning, or data science.

The Nanoedge AI static library for anomaly detection is the code that contains the AI model. It is designed to gather knowledge incrementally during a learning phase to be able to detect potential anomalous machine behaviors, and possibly predict them.

Tessolve's PM application shall be used in the following application using Nanoedge libraries,

- Anomaly Detection
- n-class classification(nCC)
- 1-class classification(1CC)
- Extrapolation(E)

PM demo kit details:

- PM demo kit is equipped with low-power MCU & NPU that allow the user to run the AI model on a long-life rechargeable battery PM demo kit.
- The kit also contains the possibility of Edge communication that allows users can send the PM data to a dash kit using cloud computing such as AWS, Azure, etc.,
- The kit contains an Ultra-low-power ARM Cortex-M4 microcontroller with DSP and FPU (STM32L4R9Zi)
- Ready-to-go software package with wireless IoT. Custom applications and software packages can be offered on request.

The demo kit takes the leverage of Tessolve's outstanding expertise in multimedia and embedded control technologies. This expertise enables a market-leading system performance One key value of Tessolve's system solutions is the ready-to-go software package described above.

PM demo kit Operation

- A custom AI model is trained using Nanoedge AI to predict the abnormality in the motor.
- The model then shall be flashed onto the demo kit
- Once the model has been flashed successfully, the User can create the abnormality in the motor and test.
- Once the demo kit detects the abnormality in the motor, the AI model running on NPU predicts the corresponding output shall then be transferred to the dashboard using the API call

PM demo kit snapshot

For demo kit, Linux is the standard offering but versions for RTOS are available on request

Technical Information	Demo kit
USB Host	x1 standard USB 2.0 Host Type A connector
Industrial IoT Sensors	3D accelerometer, 3D Gyro iNEMO inertial measurement unit with machine learning core.
Serial	x1 RS232 x1 UART
SDIO	Micro SD card support (SDXC)
Power Input	Standard 5V Lithium Ion rechargeable battery
Temperature Range	Commercial
RoHS	The hardware is RoHS complaint

PM demo kit Architecture diagram

Sales Offices

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