



# Acoustic Scene Classification

## ARTIFICIAL INTELLIGENCE

Tessolve's Acoustic Scene Classification (hereafter referred to as ASC) is an AI-based use case to predict the actual scene based on the audio sounds. Input audio sound received from the microphone shall be processed by an AI model running on NPU inside Tessolve's demo kit and predicts the scene.

ASC operates in a very low power mode which enables Tessolve's demo kit can be run on the battery that enhances the possibility of a long lifetime of the kit

**Tessolve's ASC application shall be used in the following application use cases such as,**

- ⇒ Predicting Baby cry to monitor infant baby's activity
- ⇒ Predicting Dog bark sound for anonymous
- ⇒ Predicting glass break sounds for intruder detection
- ⇒ Predicting bird sounds for weather monitoring & forecast
- ⇒ Predicting vehicle sounds for classifying outdoor activities
- ⇒ Predicting malls, library, and sounds for classifying indoor activities

### ASC demo kit details:

- ⇒ ASC demo kit is equipped with low power MCU & NPU that allow user to run the AI model on long life rechargeable battery ASC demo kit.
- ⇒ It contains BLE that allows user to connect device to a mobile app for accessing ASC data
- ⇒ The kit also contains the possibility of Edge communication that allows user can send the ASC data to a dashboard using cloud computing such as AWS, Azure etc.,
- ⇒ The kit contains Ultra-low-power ARM Cortex-M4 microcontroller with DSP and FPU (STM32L4R9)
- ⇒ 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.

### ASC demo kit Operation

A custom AI model is trained using the custom dataset to predict the following scenes,

- ⇒ Baby cry
- ⇒ Dog bark
- ⇒ Indoor

The model then shall be flashed onto the demo kit

Once the model has been flashed successfully, the User can give an input audio sample of either of 3 scenes mentioned above

Once the demo kit starts listening to the audio, the AI model running on NPU predicts the scene and the corresponding scene output shall then be transferred to a mobile app using BLE or to the dashboard using an API call

### ASC demo kit snapshot



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

Technical Information	Demo kit
BLE	x1 standard BLE support
USB Host	x1 standard USB 2.0 Host Type A connector
Analog Audio	Microphone ON
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 compliant

### ASC demo kit Architecture diagram



### Sales Offices

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