Voiceprint Monitoring Technology

Voiceprint monitoring, Health auscultation,
Intelligent Inspection and Safety Escort

Voiceprint Recognition Field Leader

Technology

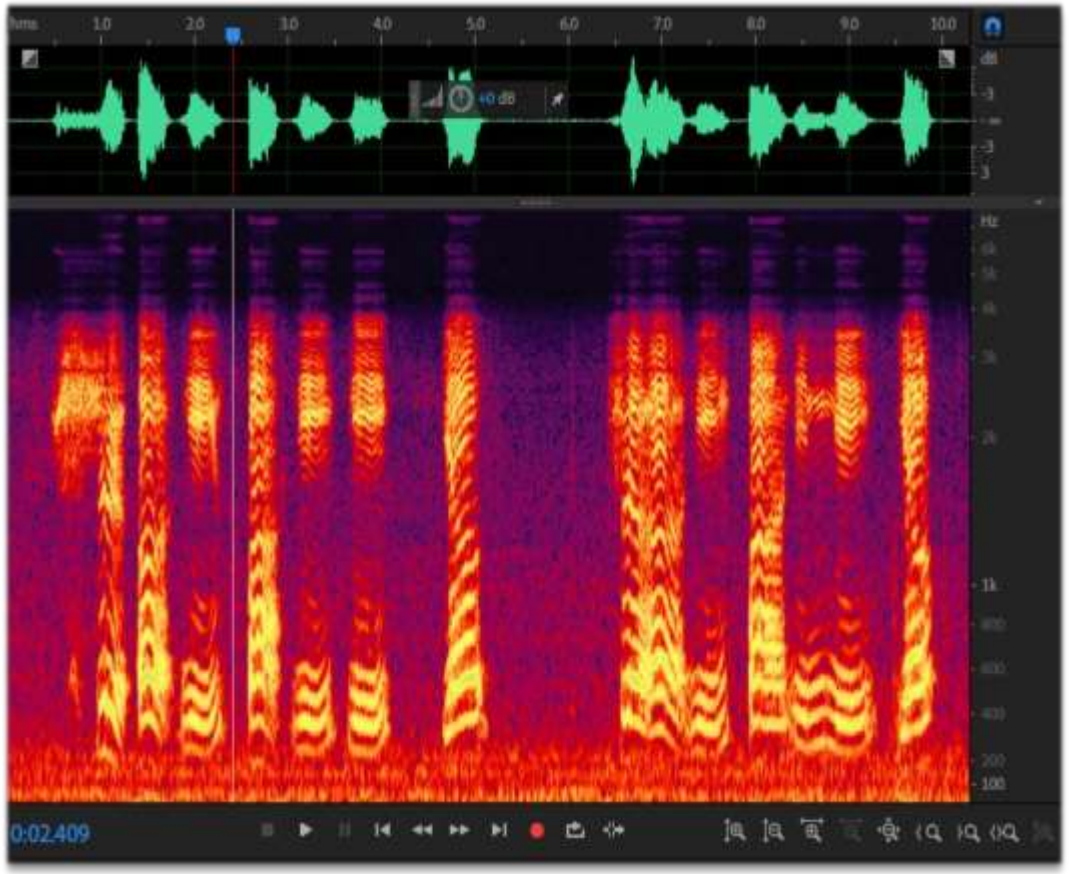
- A leading-edge AI voiceprint company focusing on monitoring & diagnostic of the equipment of mission critical infrastructures.

- On the basis of the independent intellectual property rights CMFMC 3.0 algorithm engine, it was developed a series of vertical algorithm engines and solutions for Energy (Electricity, Oil & Gas, New Energy), Transport (Automotive, Aviation, Railway, Bridge, Tunnel), Water Conservancy, Steel, Mining, and many other fields.

Industrial Voiceprint Recognition Principle

Equipment Noise

Acoustic spectrograms



Unique vibration acoustic patterns are generated by mechanical vibration during the operation.

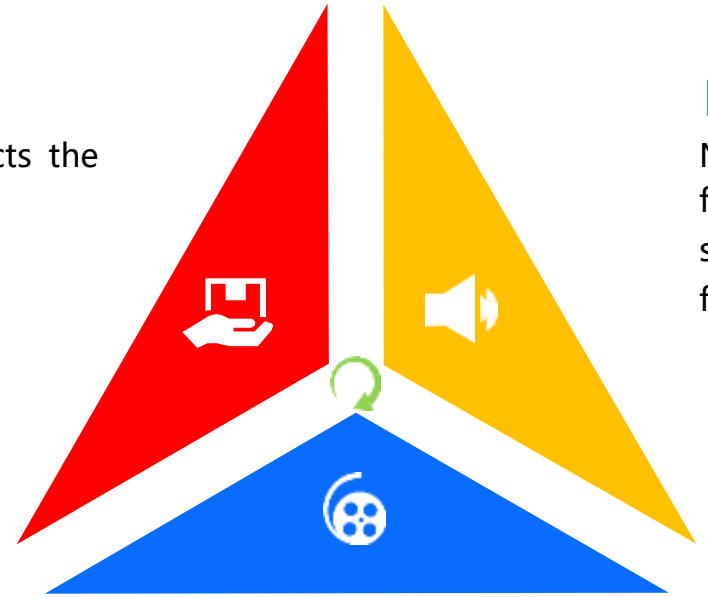
The acoustic signal is acquired, digitalized and extracted into frequency spectrum, amplitude, inverted spectrum, waveform, wave peak, probability density, cliff coefficient and other acoustic characteristics. Furthermore, these characteristics will not be affected in the high voltage and strong electromagnetic environment.

Therefore, we make use of this unique sound characteristics to compare the voiceprint information of the detected equipment with the normal voiceprint information, and identify the operation state of industrial equipment, early warning fault and fault judgment.

Technical Pain Points

Pain Point 1

Various environmental noise affects the acoustic signal.



Pain Point 2

Negative sample for industrial equipment failure is difficult to collect, which may take several months or even years. It is difficult to form a large fault samples database.

Pain Point 3

It is difficult to extract the voiceprint characters. Using the parameter recognition algorithm for the equipment of different grades or models, we need to build up the corresponding parameters to match the faults of each equipment. Huge workload on parameter table.

Advantages of Voiceprint Monitoring Technology

Tech Advantage 1

The bone conduction sensor is close to the equipment shell, and has low acoustic impedance. It shields external noise, listens to transformer faults, and has higher sensitivity.

Tech Advantage 2

The collector has built-in DSP voiceprint noise reduction algorithm and unique sound stratification (layer) technology, which can decompose multiple sets of equipment and the overall noise into their own equipment and their own noise, so as to achieve accurate identification and accurate analysis.

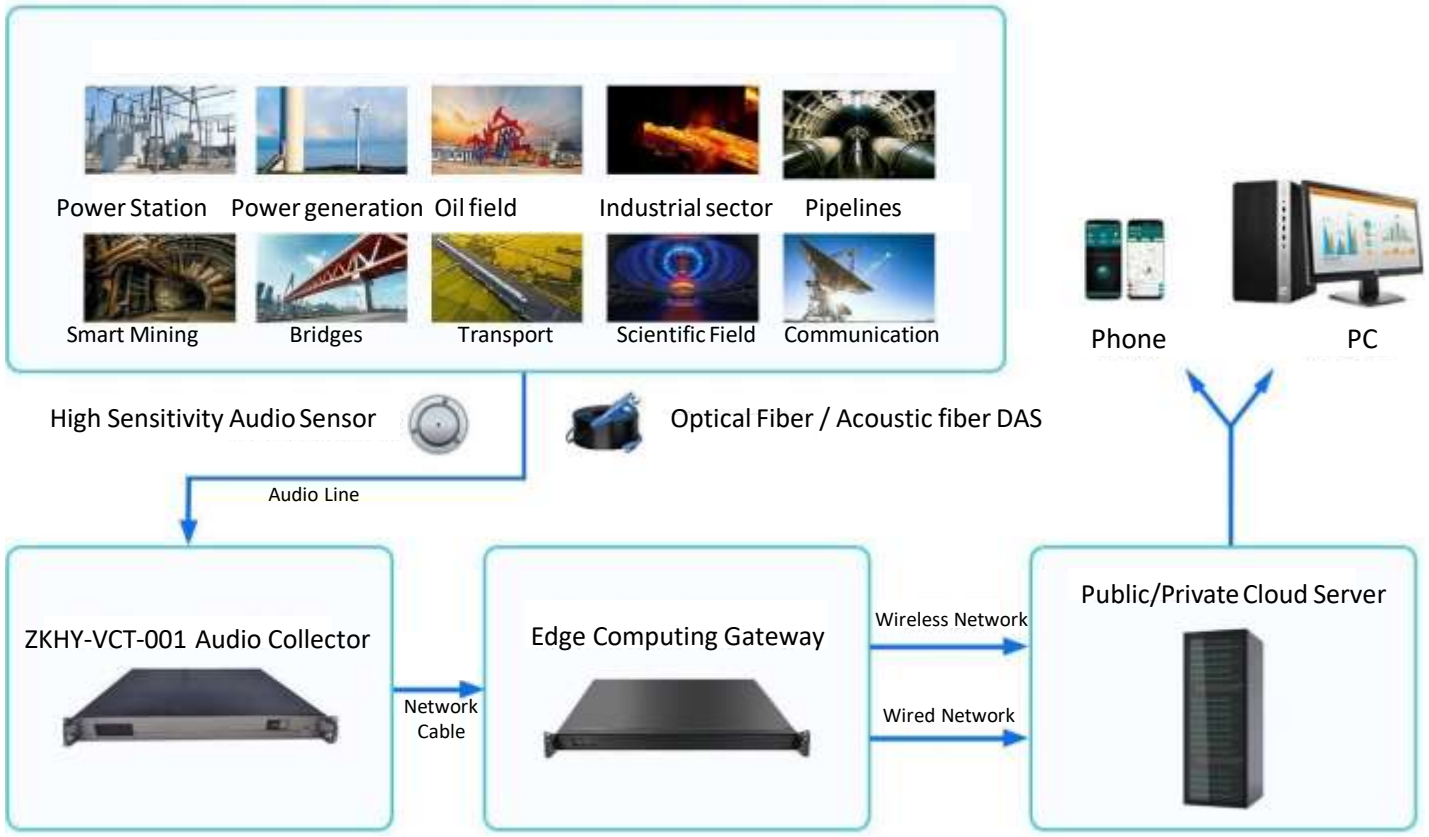
Tech Advantage 3

It is the only deep learning algorithm to conduct online detection and fault warning of production equipment in mission critical infrastructures. Positive samples for 1:1 screening (no need to accumulate samples for a long time); Negative samples for 1:N automatic labeling.

Tech Advantage 4

There are large voice pattern sample libraries, including audio samples, equipment working status, fault feature knowledge base, etc. At present, we have stored a certain number of positive sample library files and negative samples.

Voiceprint Monitoring System



The topology of the online voiceprint monitoring system consists of:

Acquisition End, Algorithm End, Display Terminal

Voiceprint Sensor
For sound collection;

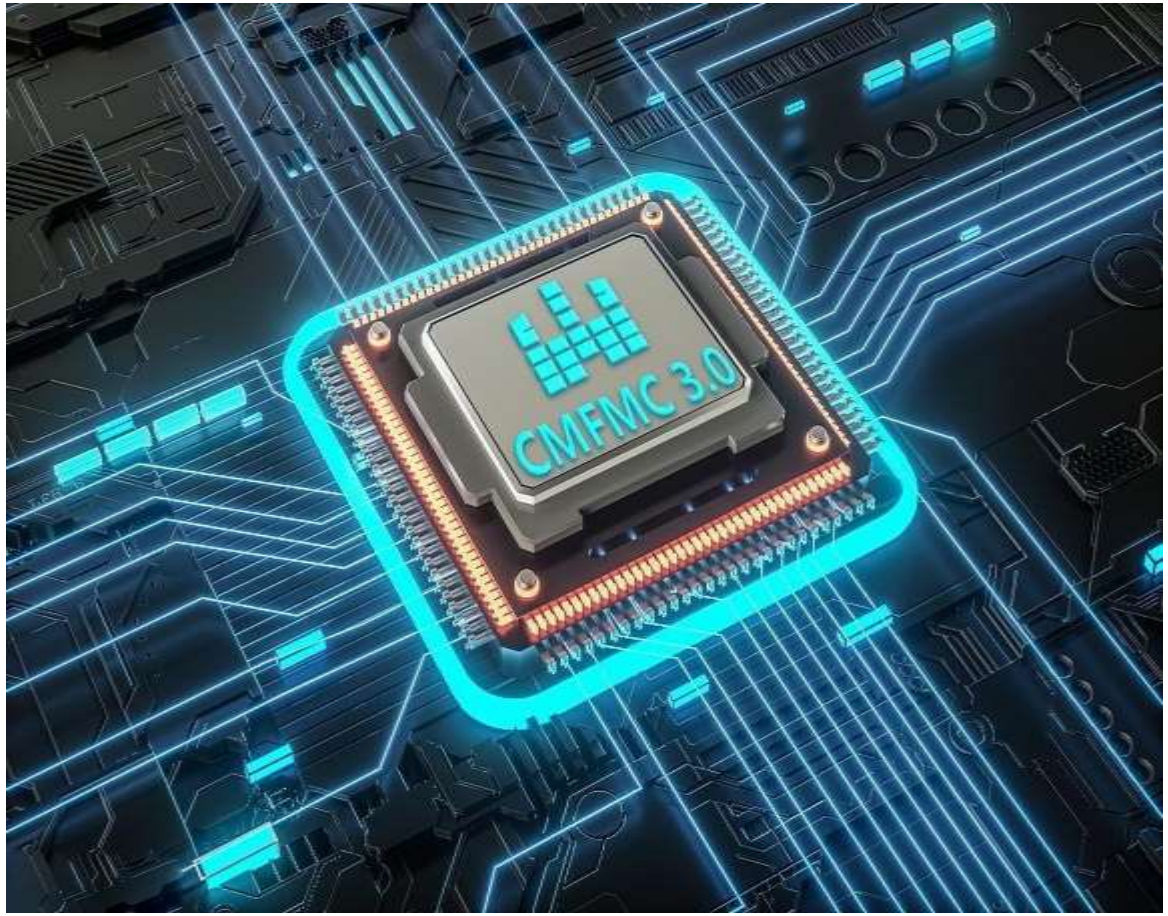
Voiceprint Audio Collector
Receive the audio from the sensor and continuously generate the audio files;

Algorithm Device, Edge Computing Gateway Receive collector files, filter regular sound, and report faulty audio;

Cloud Server Engine
Analyze specific fault types and distribute fault messages in real time;

Terminal application
Mobile phone APP / PC terminal

Core Technology



AI-Voice CMFMC3.0 Engine

5 advantages：

① **Inhouse Innovative Technology**: Full frequency sound wave emission and sound wave imaging technology

② **Cross-channel Recognition**: Data collection can even be captured through mobile phone APP

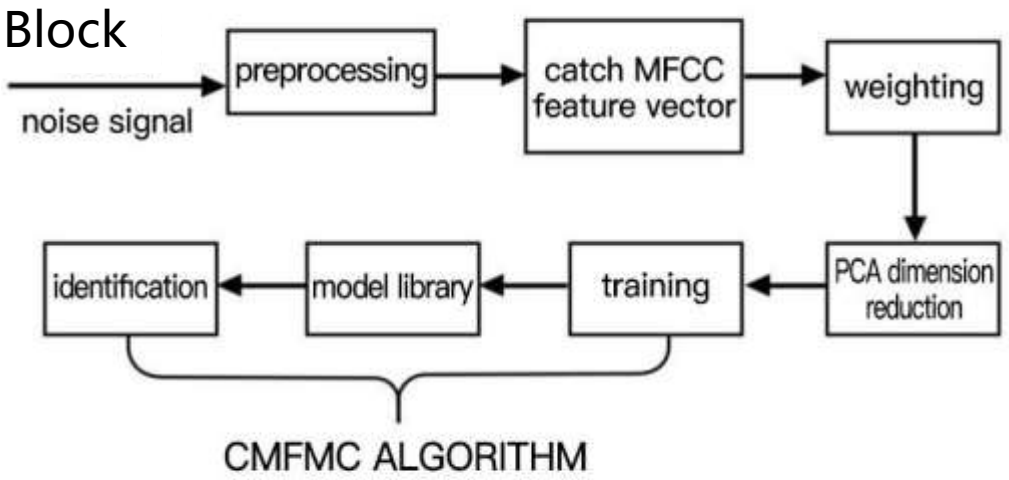
③ **Bone Conduction Sensor + DSP Noise Reduction Tech**: Commercialize the technology under complex working environments

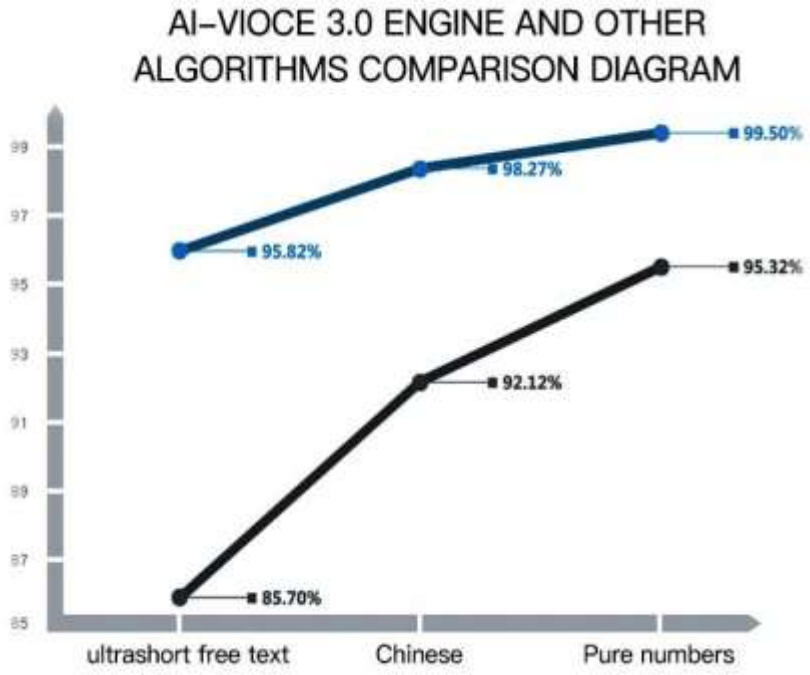
④ **Ultra-high Recognition Rate**: the recognition rate reaches 99.84% (White paper in Sound Valley Lab)

⑤ **Inhouse Deep-Learning Framework**

CMFMC 3.0 Models

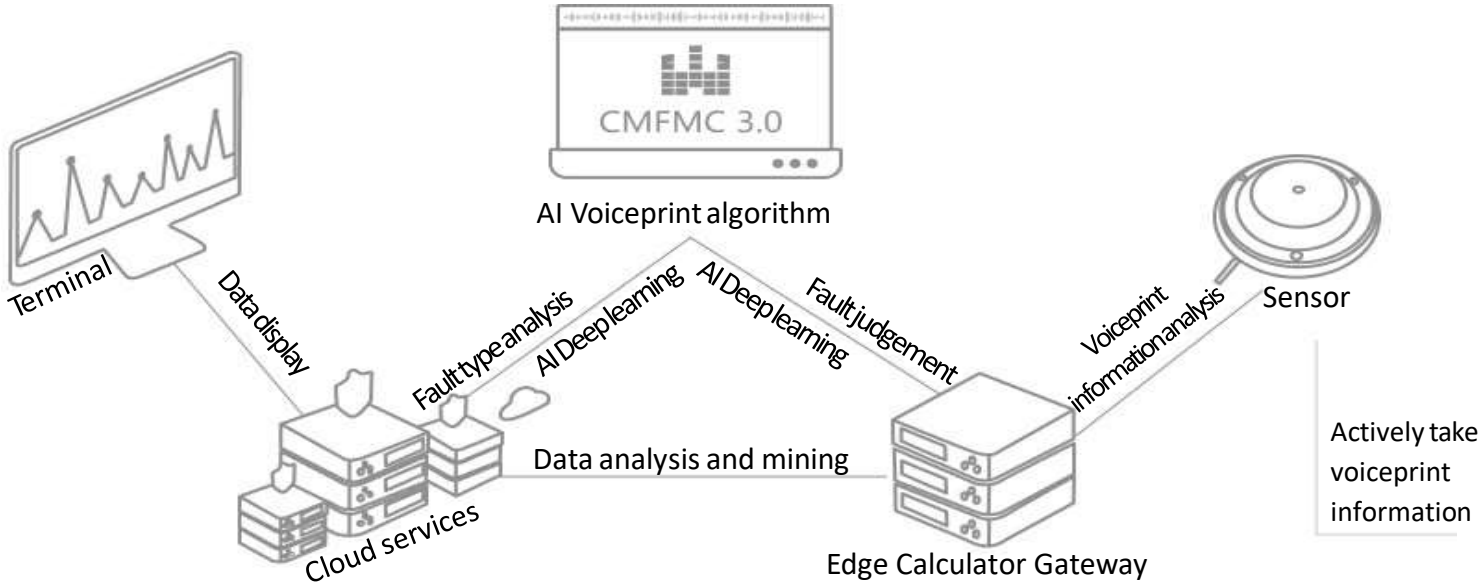
Ai-Voice CMFMC 3.0 Engine Comparison Diagram





The " W " - type Network Architecture

“ W “ architecture



CMFMC 3.0

Proven Technology for Huge Market Potential

Power

Oil / Petrochemical

Iron and Steel

Smart mining

Road & Bridge

Pipeline

Rail

Nuclear reactor

Voice Intelligence

A wide range of application scenarios

The market for voiceprint recognition is huge!

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