

arm

AI Ecosystem Catalogue

Partner Solution Brief

Picovoice: NLU on Arm Cortex-M

Picovoice technology enables speech recognition on resource-constrained devices.

Vancouver-based Picovoice creates private speech technology that offers the accuracy of the cloud within the resource constraints of low-cost embedded devices.

Traditionally, voice models required extensive data collection and training per-model. Picovoice uses the principle of *transfer learning* to remove this requirement and drastically simplify development and reduce time-to-market while achieving superior accuracy.

Bespoke voice models are trained entirely using text with a type-and-click online training via Picovoice Console. Using the Picovoice Shepherd tool, these custom-built models can be easily deployed to MCUs in the Arm Cortex-M family.

PICOVOICE

Use Case: Speech Recognition

Arm IP: Cortex-M

Speciality: On-Device Voice AI

Design, Train, & Deploy Voice Models to MCUs

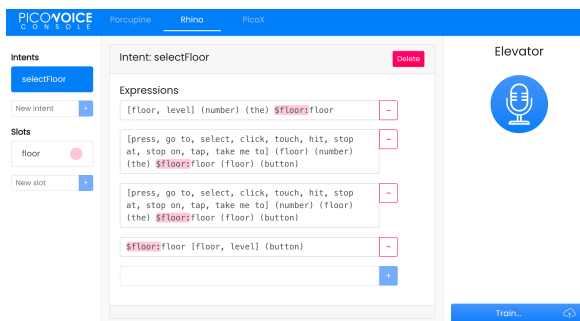


Figure 1: Designing a custom voice model



Figure 2: Natural language voice inference running on-device

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The Challenge: Run Voice AI Entirely on the Edge

Most speech recognition today runs in the Cloud, creating three fundamental concerns:

Privacy

Reliability

Cost

The Solution: Bespoke Voice AI

Generic Speech-to-Text attempts to understand every possible phrase in a spoken language. Picovoice's Speech-to-Intent engine, on the other hand, creates a domain-specific speech context that understands voice commands for its given purpose, and directly infers voice commands from audio, with no intermediate text representation. This focused approach provides dramatic resource and accuracy improvements.

Picovoice uses its proprietary technology, focused approach, and hardware-specific features like Arm DSP extensions to achieve private Voice AI on MCUs.

Combining the Picovoice Console and Picovoice Shepherd tools, users can design, train, and deploy offline voice recognition that works on Cortex-M.

The Result: Offline Voice AI on Cortex-M

Demo Video

Web Demos