

Novel method for Ultra-Low-Footprint Keyword-Spotting

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In our poster, we will present a novel NN topology which allowed us to achieve Key-Word Spotting recognition at a good rate with an ultra-low memory and compute footprint.

Problem to be solved :

With the advent of advanced Human Machine Interface (HMI), there exists a need to provide always-on Keyword spotting. This needs to be done at lowest power (ie lowest compute requirement) and ideally with lowest memory footprint.

With limited compute power and RAM availability, traditional methods such as MFCC extraction and 2D convolution are too expensive for usage.

Technical approach and its novelty :

We present an NN topology which performs a low compute feature extraction, includes an efficient convolution algorithm and a simple posterior.

Results :

Our topology allows Keyword spotting with a model size of 5kB and a running memory requirement of 1kB.

We are able to run the full algorithm at a cost of around 1MIPS on several of our existing Microcontrollers.

Significance to TinyML Community :

We believe that the novel method we use outperforms published algorithms and will allow TinyML community to benefit from our research.