



Meeami AI Based Multivariate Noise Suppression

Product Data sheet

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Meeami Technologies Private Limited, 5th Floor, Wing No.1, Block D, Cyber Gateway, Hitech City, Madhapur, Hyderabad, India 500081

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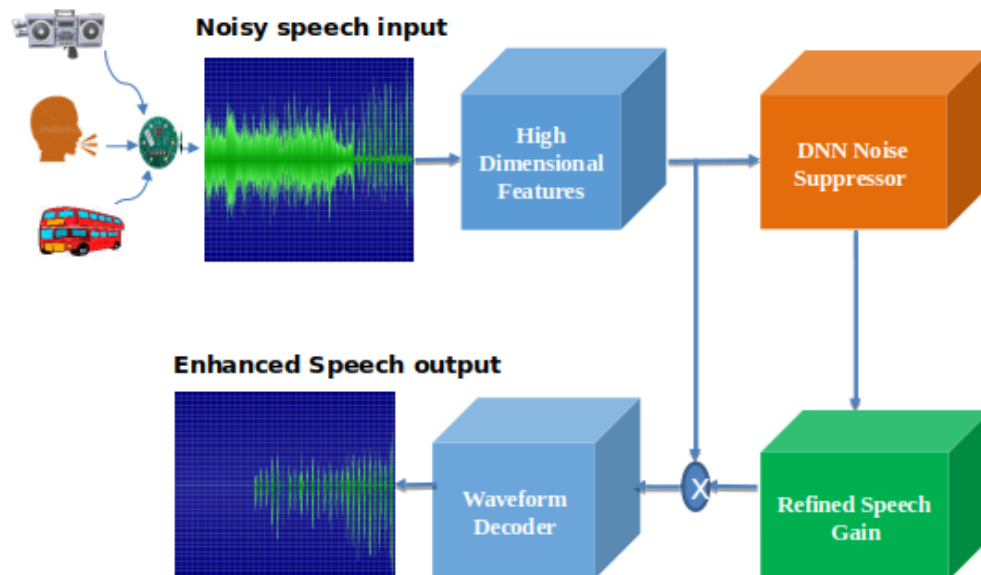
1. Product Data Sheet

Meeami Technologies ClearVoice Multi Variate Noise Suppression suppresses stationary and dynamic background noises and enhances the speech for better perceived intelligibility and quality. This is an end to end AI and DSP based deep learning model trained on thousands of hours of noisy speech data comprising more than 100 distinct noises. MVNS operates on frame by frame basis with the frame size of 16ms. For each frame, the input PCM signal is mapped to high dimension feature vector and analyzed to estimate mask/gain. The estimated mask/gain is applied to the input features to separate speech features and then convert back to PCM format using linear decoder.

Now experience noise free calls and conferences from any place and any device.

Meeami's Noise canceller leverages deep learning and voice signal processing algorithms to effortlessly remove many kinds of noises such as click noise, babble noise, baby crying or dog barking in the background, road noise and many more to give you a clean experience.

The beauty of the technology is that it needs only a single mic to work and so it can be used in all devices such as laptops, mobiles and more.



SUITABLE FOR MACHINES AND VOICE CALLS

- Low voice spectral distortion for HMI applications
- Preserved Speech Intelligibility for voice calls
- Platform based customizations
- Low Resource requirement.

1.1 Processing resources requirement

- CPU usage
 - x86_64 Windows: ~100 MHz (i7 7th Gen)
 - x86_64 Linux: ~110 MHz (i7 7th Gen)
 - x86_64 MAC: ~90 MHz (i7)
 - arm-v8 Android: ~320MHz (Snapdragon 845)
 - arm-v8 iOS: ~160MHz (iPhone 6s)

Note, Enabling Aggressive mode (DSP option /Post process) may add additional ~60 MHz, it may vary slightly on different processor/microarchitecture and with different memory configurations. Customer could able to enable or disable the DSP option (DSP based post proc module). Suggested to enable this option based on customer's CPU budget, listening and objective score trade-off. DSP module is actually value adding in objective measurement like POLQA score improvements.

CPU difference with AVX2 support: MVNS solution is optimized for intel processors but CPU number is slightly high for the intel older generation processor's without AVX2 support. This additional CPU may vary for those processors based on instruction set supported.

Additional CPU ~40MHz to 120MHz utilized in CPUs without AVX.

- Memory usage

Total Memory Required: 7,395 KB

Table 1. Memory requirement

Text Memory	120 KB
Data Memory	4,692 KB (Includes Model Memory)
State Memory	2,563 KB
Stack Memory	20 KB

- Performance
 - Algorithmic Delay: 40 milliseconds.
 - Avg. POLQA: 3.45 (250 Test vectors – 50 Noises X 5 SNRs)

1.2 List of major noises supported by MVNS

Only Major Noise types are listed but MVNS can handle many more noise types as well.

AC	Footsteps	Shopping mall	Acoustic Guitar	Living Room	Coffee Grinder
Aeroplane	Glass Breaking	Siren	Applause	Ocean waves	Cow moo
Airport	Grocery	Street noise	Bell ringing	Rain drop	Crowd creaming
Alarm	Gun	Table noise	Bicycle bell	Rooster	Finger nap
Babble	Gym	Telephone	Bus arrival/ departure	Saxophone	Foghorn
Baby cry laugh	Horn	Traffic	Campfire	Sea waves	Harmonica
Bird chirp	Keyboard	Train	Car Engine	Thunderstorm	Helicopter
Bus	Metro	Washing machine	Car revving	Vacuum Cleaner	Horse clip clop
Cafe	Motor vehicle	Water running	Cat Meow	Violin fiddle	Horse neighing
Car	Mouse Clicks	Wind	Cat roar	Washer Dryer	Motorcycle

Chair noise	Music	Children playing	Chewing Eating Sipping	Waterfall	Oboe
Chips munching	Neighbour	Coin dropping	Church bell	Whistling	Plates scraping
City centre	Office	Construction	Clock gong ringing	Wind Chime	Pressure cooker
Clapping	Paper	Dentist drilling	Copy Machine	Wind rustling	Sewing machine
Cooking	Park	Engine idling	Dog howling	Aircraft jet plane	Shofar
Crowd	Pink	Fireworks	Elevator	Blender	Singing bowl
Dog bark	Rain	Jackhammer	Fowl	Camera	Smoke detector alarm
Door	Residential area	Shower	Guitar Drum	Clarinet	Snare drum
Drone	Restaurant	Trimmer	Kitchen Indian	Clock tick tock	Train horn
Fan	River	Acceleration	Laughter	Clock	Turkey gobble

