Exhibit A

'058 Patent:

1. A system for detecting voiced and unvoiced speech in acoustic signals having varying levels of background n

at least two microphones that receive the acoustic signals;

at least one voicing sensor that receives physiological information associated with human voicing activity; and

at least one processor coupled among the microphones and the voicing sensor, wherein the at least one processo

generates cross correlation data between the physiological information and an acoustic signal received at one of microphones;

identifies information of the acoustic signals as voiced speech when the cross correlation data corresponding to acoustic signal received at **the one receiver** exceeds a correlation threshold;

generates difference parameters between the acoustic signals received at each of **the two receivers**, wherein the parameters are representative of the relative difference in signal gain between portions of the received acoustic

identifies information of the acoustic signals as unvoiced speech when the difference parameters exceed a gain

identifies information of the acoustic signals as noise when the difference parameters are less than the gain thre

2. A method for removing noise from acoustic signals, comprising:

receiving the acoustic signals at two receivers and receiving physiological information associated with human v voicing sensor;

generating cross correlation data between the physiological information and an acoustic signal received at one o receivers;

identifying information of the acoustic signals as voiced speech when the cross correlation data corresponding t acoustic signal received at the one receiver exceeds a correlation threshold;

generating difference parameters between the acoustic signals received at each of the two receivers, wherein the parameters are representative of the relative difference in signal gain between portions of the received acoustic

identifying information of the acoustic signals as unvoiced speech when the difference parameters exceed a gai

identifying information of the acoustic signals as noise when the difference parameters are less than the gain thr

3. The method of claim 2, further comprising generating the gain threshold using standard deviations correspon generation of the difference parameters.

4. The method of claim 2, further comprising performing denoising on the identified noise.

'091 Patent

1. A method for removing noise from acoustic signals, comprising:

receiving at least two acoustic signals using at least two acoustic microphones positioned in a plurality of locati

receiving a voice activity signal that includes information on vibration of human tissue associated with human v
user;

generating a voice activity detection (VAD) signal using the voice activity signal;

generating at least two transfer functions representative of a ratio of energy of the acoustic signal received using
different acoustic microphones of the at least two acoustic microphones when the VAD indicates that user voici
absent, wherein the at least two transfer functions comprise a first transfer function and a second transfer functi

removing **acoustic noise** from at least one of the acoustic signals by applying the first transfer function and at le
combination of the first transfer function and the second transfer function to the acoustic signals and generating
signals

2. The method of claim 1, wherein removing noise further comprises:

generating one transfer function of the at least two transfer functions to be representative of a ratio of energy of
received when the VAD indicates that user voice activity is present; and

removing noise from the acoustic signals using at least one combination of the at least two transfer functions to
denoised acoustic signals.

3. The method of claim 1, wherein the acoustic signals include at least one reflection of at least one associated r
and at least one reflection of at least one acoustic source signal.

4. The method of claim 1, wherein generating the at least two transfer functions comprises recalculating the at l
functions during at least one prespecified interval.

5. The method of claim 1, wherein generating the at least two transfer functions comprises use of at least one te
from a group consisting of adaptive techniques and recursive techniques.

11. A system for removing **acoustic noise** from the acoustic signals, comprising:

a receiver that receives at least two acoustic signals via at least two acoustic microphones positioned in a plural

at least one sensor that receives human tissue vibration information associated with human voicing activity of a

a processor coupled among the receiver and the at least one sensor that generates a plurality of transfer function
plurality of transfer functions includes a first transfer function representative of a ratio of energy of acoustic sig
at least two different acoustic microphones of the at least two acoustic microphones, wherein the first transfer f
generated in response to a determination that voicing activity is absent from the acoustic signals for a period of
plurality of transfer functions includes a second transfer function representative of the acoustic signals, wherein
transfer function is generated in response to a determination that voicing activity is present in the acoustic signa
time, wherein **acoustic noise** is removed from the acoustic signals using the first transfer function and at least o
the first transfer function and the second transfer function to produce the denoised acoustic data stream.

12. The system of claim 11, wherein the sensor includes a mechanical sensor in contact with the skin.

13. The system of claim 11, wherein the sensor includes at least one of an accelerometer, a skin surface micropl
contact with skin of a user, a human tissue vibration detector, a radio frequency (RF) vibration detector, and a la
detector.

15. The system of claim 11, further comprising:

dividing acoustic data of the acoustic signals into a plurality of subbands;

generating a transfer function representative of the ratio of acoustic energies received in each microphone in eac

removing **acoustic noise** from each of the plurality of subbands using a transfer function, wherein a plurality of
data streams are generated; and

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