**Title of invention**

*Training system capable of transducing, detecting, processing, storing, reproducing and simulating physiological sounds*

**Abstract of the invention**

*Current electronic stethoscopes…*

*Motivation*

*Training – Auscultation training includes the proper positioning of the stethoscope and the identification of physiological sounds, such as heart and lung sounds. Medical students currently have access to*

*Diagnostic – While electronic stethoscopes have become more common in the most recent years, none of these offer a diagnostic functionality.*

*Our team has developed a training system, consisting of specialized hardware components, capable of transducing acoustic physiological signals, detecting normal and abnormal/pathological acoustic patterns, process or modify signals*

**Concise Description of the Invention**

*Signal Transduction*

*Our system has been equipped with one or several acoustic transducers capable of translating physiological acoustics to an analog electrical signal.*

*Our system has the capability of translating physiological acoustics to analog electrical signals, through one or several acoustic transducers*

*Detection*

*Our system has been equipped with a library of functions for the detection of acoustic signatures and/or features associated with normal or abnormal physiology. Acoustic signature or feature detection may be achieved through signal correlation functions in the frequency domain, but could also include simpler methods in the time-domain.*

*Processing*

*Our system has been equipped with a library of functions for the processing, modification or enhancement of acoustic signals. Signal processing includes, but is not limited to the filtering, amplification or decomposition of the input signal.*

*Storage*

*Our system has been equipped with volatile and non-volatile memory, allowing for both long- and short-term data storage. Non-volatile memory includes, but is not limited to flash memory internal to the processor and external to the board, such as an SD card. Non-volatile memory has been dedicated to the long-term storage of configuration files, media and other digital resources. Volatile memory includes, but is not limited to randomly allocated memory (RAM). Volatile memory may be used by built-in functions.*

*Reproduction*

*Our system has been equipped with speakers capable of reproducing or playing acoustics signals with a wide range of frequencies. In coordination with our system’s function library, our device is capable of reproducing incoming as well as pre-recorded and stored signals.*

*Simulation*

*Our system has been equipped with a library of functions and reference sounds, for the synchronous and asynchronous simulation of physiological and pathological conditions. Synchronous simulation refers to the recreation of physiological or pathological conditions in synchrony with the input biological signal. Signal synchronization includes, but is not limited to time, amplitude and/or frequency synchronization. Asynchronous simulation, on the other hand, is independent of the input biological signal.*

Comparison Table

*See attached spreadsheet…*