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Bio-Impedance Analyzer Diagnostic Tool
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Figure 3 : A non invasive bioimpedance analysis.

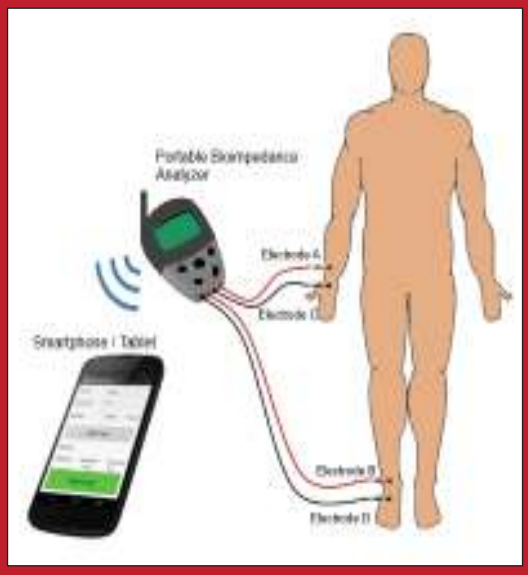
The invention can be described as a portable general-purpose bio-impedance analyzer for medical diagnosis. Bio-impedance represents the response of a living body tissue to an externally applied electric current and consists of resistance and reactance components. In biological tissues, resistance arises from extra and intra-cellular fluids whereas capacitive reactance arises from cellular membranes. The measurement of bio-impedance is conducted by passing a sub micro-ampere sine wave current signal through human body and the output of the measurement displays bio-impedance parameters, namely, resistance, reactance and phase angle.

Bio-impedance analysis offers a noninvasive and real-time method to monitor human body tissues and hence is useful in various clinical applications. The usability of bio-impedance analysis has been demonstrated in multitude of clinical applications ranging from tumor monitoring, detection of tissue ischemia, non-invasive continuous blood glucose monitoring, and diagnosis and monitoring of lymphedema to assessment of human body composition. However, its clinical potential is curbed by the lack of cost-effective portable and wearable general-purpose bio-impedance analyzer in the market.

Our current bio-impedance analyzer diagnostic tool, shown in Figure 1, is a general-purpose device that is able to provide bio-impedance analysis. This analyzer is portable, rapid, low-cost, locally made and can be easily customized for specific disease monitoring. Hence, this invention opens a new avenue for the widespread clinical applications of bio-impedance analysis. Our team, for example, is currently developing a wearable non-invasive bio-impedance monitoring device for classifying risk in dengue patients. This new device will provide human body composition information namely water compartments and mass distribution, and will incorporate Artificial Intelligence algorithms for clinical decision support system. In this future prototype, the data will be transferred wirelessly via Bluetooth. Computerized data analysis could then be performed remotely in clinician's mobile application for a particular disease, as envisioned in Figure 2.

Figure 1 : Performing an analysis via the clinicians mobile applications.

Figure 2 : The Bioimpedance Analyzer, which has been recently granted its patent.



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