

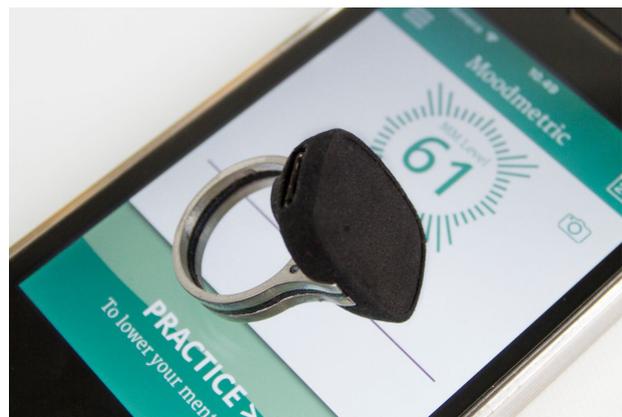


Moodmetric smart ring & electrodermal activity measurement

The Moodmetric smart ring for preventive stress management is an invention of a Finnish company Vigofere Oy. The inventor Henry Rimminen (Ph.D.) has a solid background in sensor technology and physiological measurements. He came up with the idea of incorporating the electrodermal activity (EDA) measurement into a ring in 2011. The phenomenon measured is also known as skin conductance (SC) and galvanic skin response (GSR). The measurement signal accuracy is comparable to laboratory devices and the research by the Finnish Institute of Occupational Health (Torniainen et al. 2015) has found the device valid for field research.

Electrodermal activity (EDA) is one of the most studied psychophysiological markers of the functioning of the autonomous nervous system and it has been applied in psychophysiological research for over 100 years (Boucsein 2012). EDA is an indicator of the sympathetic activity of the autonomous nervous system that is associated with emotion, cognition, and affection (e.g. Critchley 2002). The skin becomes a better conductor of electricity when the eccrine sweat glands process sweat to skin surface. Eccrine glands are innervated by the sympathetic nervous system and are part of the fight or flight response system. The palmar site of the skin or sole provide the best measurement points due the great intensity of the eccrine sweat glands. (e.g. Boucsein 2012.)

The Moodmetric index is calculated by an algorithm developed by Vigofere Oy. It describes arousal of a person on a scale of 1 to 100. High arousal can be both positive and negative, e.g. being enthusiastic or in anguish. The sympathetic nervous system is very active. When the index numbers are low, the parasympathetic nervous system works and enhances recovery. The Moodmetric index daily average number is an indicator of the balance of the autonomous nervous system. This balance is important when the target is to prevent chronic stress. Clinical studies starting in spring 2018 aim to further validate research based information supporting these hypothesis.



There are little ambulatory measurement applications for stress available. Long term measurement is needed when a) wanting to understand is high stress load momentary or going on for weeks or months indicating chronic stress b) motivating a person to efficient stress management with real time feedback. The Moodmetric smart ring fits these purposes well. Read more about physiological measurement of stress in our series of five articles: <http://www.moodmetric.com/long-term-stress-measurement/>

Diseases relating to the functionality of the autonomous nervous system may affect electrodermal activity. Patients with hyper- or hypothyroidism have been recorded with unusual EDA measurements (e.g. Dolu et al. 1997; Dolu et al. 1999). Within a variety of anxiety disorders (e.g. panic disorder and posttraumatic stress disorder), increased electrodermal activity and reactivity has been observed (Braune et al., 1994; Hoehn et al., 1997, Lader & Wing, 1964; Blechert et al., 2007). However, in depression electrodermal activity is often reduced (Argyle, 1991; Ward et al., 1983). Electrodermal activity measurement has not been largely applied in clinical research until now. It has been limited to laboratory environment before the entry of wearable devices.

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