Autonomic Nervous System Dynamics for Mood and Emotional-State Recognition: Significant Advances in Data Acquisition, Signal Processing and Classification

By Gaetano Valenza

Springer. Hardcover. Condition: New. 162 pages. Dimensions: 9.2in. x 6.2in. x 0.7in.This monograph reports on advances in the measurement and study of autonomic nervous system (ANS) dynamics as a source of reliable and effective markers for mood state recognition and assessment of emotional responses. Its primary impact will be in affective computing and the application of emotion-recognition systems. Applicative studies of biosignals such as: electrocardiograms; electrodermal responses; respiration activity; gaze points; and pupil-size variation are covered in detail, and experimental results explain how to characterize the elicited affective levels and mood states pragmatically and accurately using the information thus extracted from the ANS. Nonlinear signal processing techniques play a crucial role in understanding the ANS physiology underlying superficially noticeable changes and provide important quantifiers of cardiovascular control dynamics. These have prognostic value in both healthy subjects and patients with mood disorders. Moreover, Autonomic Nervous System Dynamics for Mood and Emotional-State Recognition proposes a novel probabilistic approach based on the point-process theory in order to model and characterize the instantaneous ANS nonlinear dynamics providing a foundation from which machine understanding of emotional response can be enhanced. Using mathematics and

Reviews

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-- Dr. Catherine Wehner

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