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Correlation study of human daytime activity pattern and night time sleep quality. SHARMIN SULTANA, student of Electrical Engineering Dept. at Lamar University, DR. GLEB TCHESLAVSKI, Associate professor of Electrical Engineering Dept. at Lamar University — Although day-time activities and night-time sleep may seem to be controlled by different physical mechanisms in human, several methods have been developed over the last years to estimate a correlation between them. The total counts of actigraphy data and self-rated evaluation of sleep quality have been used in most research. In this paper, a new correlation study of human daytime activity pattern and sleep quality based on completely objective and quantitative data is discussed. Many factors, such as light exposure, diet, daytime activity, have been identified as possibly affecting human sleep. In this method, the quality of sleep is evaluated using the delta power of non-rapid eye movement stage sleep in the electroencephalogram. The fluctuation of human actigraphy data follows a scale-invariant pattern that is quantified by the detrended fluctuation analysis. A positive correlation exists between the human day-time activity pattern and the sleep quality. The subjects, whose daytime activity pattern followed a robust scale-invariant pattern, are more likely to experience a better sleep characterized by a higher total delta power. The aim of this paper is to assess how human day-time activity pattern correlates with the night-time sleep quality.

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