INFORMATION−THEORETIC SIGNAL PROCESSING ON THE TIME−FREQUENCY PLANE AND APPLICATIONS (WedAmOR10)

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Abstract :

Time−frequency analysis is a major tool in representing the energy distribution of time−varying signals. There has been a lot of research on various properties of these representations. However, there is a general lack of quantitative measures in describing the amount of information encoded into a time−frequency distribution. Recently, information−theoretic measures such as entropy and divergence have been adapted to the time−frequency plane to quantify the complexity of individual signals as well as the difference between signals. In this paper, we present a variety of information−theoretic measures and their definitions on the time−frequency plane. The properties of these measures and how they can be applied to signal classification problems are discussed in detail. We then present an application of information−theoretic signal processing to the analysis of event related brain potentials.

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