

TITLE: Coarse Grained Correlation Dimension Analysis and Spectral Analysis of the Electroencephalo-gram of Autistic children  
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Autism is a complex neurological disorder that affects the development of children in particular with respect to social interactions. The exact cause of autism is still unknown, thus it is impossible to have a medical test that diagnoses autism. The EEGs of autistic patients are subtly discernable from those of normal patients thus EEGs are an aid to the diagnostic decision- making process by providing an appraisal of the functional status of the brain.

The EEG represents brain activity in the form of voltage fluctuations with respect to time. In this project the EEG of normal and autistic children were recorded using surface electrodes in the standard 10-20 international configuration. Power spectra and coherence of alpha, beta, theta and delta bands, as well as the coarse grained correlation dimension of the EEGs were estimated. This project evaluates the applicability of these analytical techniques to the investigation of the EEG with respect to diagnosing autism. The results of this evaluation indicated that these analytical tools provide important information about different aspects of the EEG.

This project compared the coarse-grained correlation dimension of EEG recordings with the spectral analysis obtained for a normal group of four (4) volunteers and an autistic group of three (3) patients. Results of this study indicated that the dimensional complexity of EEGs from autistic patients might be clearly distinguished from a normal group in most instances. The Power spectra, in particular monopolar power, is significantly less for the normal group

when compared to the autistic group. Measurements of coherence for the normal group may not all ways be distinguished from the estimates obtained for the Autistic group.