

عنوان مقاله:

Feature Selection Based on Genetic Algorithm in the Diagnosis of Autism Disorder by fMRI

محل انتشار:

علوم اعصاب کاسپین، دوره 7، شماره 2 (سال: 1400)

تعداد صفحات اصل مقاله: 10

نویسندگان:

.Farzaneh Sadeghian - *Department of Geodesy and Surveying Engineering, Tafresh University, Tafresh, Iran*

.Hadiseh Hasani - *Department of Geodesy and Surveying Engineering, Tafresh University, Tafresh, Iran*

.Marzieh Jafari - *Department of Geodesy and Surveying Engineering, Tafresh University, Tafresh, Iran*

خلاصه مقاله:

Background: Autism Spectrum Disorder (ASD) occurs based on the continuous deficit in a person's verbal skills, visual, auditory, touch, and social behavior. Over the last two decades, one of the most important approaches in studying brain functions in autistic persons is using functional Magnetic Resonance Imaging (fMRI). Objectives: It is common to use all brain regions in functional extraction connectivity, which leads to high dimensional space. In this study, a Genetic Algorithm (GA) has been used to select effective regions for the generation of Functional Connectivity Matrix (FCM) to differentiate between healthy and autistic people. The aim is to increase accuracy, reduce processing time, and lower the dimension of the functional connectivity matrix. Materials & Methods: In this analytical study, the dataset includes ۸۲۰ fMRI images consisting of ۴۴۵ healthy samples and ۳۷۵ people with ASD obtained from the autism brain imaging data exchange database. The K-nearest neighbor classification algorithm and the genetic algorithm were used to optimize the identification of two groups of autism and healthy people. Results: Regarding the large dimensions of the search space, the use of genetic algorithms after ۱۰۰ replications estimated the accuracy for test and validation data at ۶۱.۰۸% and ۶۲.۵۹%, respectively. The obtained results show that the genetic algorithm can increase the classification accuracy by ۱۰% on test data and ۷% on validation data by selecting ۶۷ regions. Conclusion: The obtained results prove that the proposed method is a well-designed system and can differentiate between autistic and healthy people effectively.

کلمات کلیدی:

Autism spectrum disorder, Functional magnetic resonance imaging, Classification

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1240613>

