Joint Event

11th World congress on
Addictive Disorders & Addiction Therapy

September 12-13, 2022

WEBINAR

3rd International Conference on
Epilepsy Research and Treatment

Fuzzy Feature Selection (FFS) based on different experts' judgments: A case study epilepsy's disease

Hojjatollah Farahani[1]*, **Parviz Azadfallah**[1], **Peter Watson**[2], **Marija Blagojević**[3], **Forough Esrafilian**[1], **Mehrnaz SalehiRaj**[1] and **Farzin**[1] **Bagheri Sheykhangafshe**

[1]Tarbiat Modares University, Iran
[2]University of Cambridge, UK
[3]University of Kragujevac, Serbia

Feature selection is a method for removing redundant and noisy variables in cognitive psychology. There are already some methods for doing this which use approaches such as genetic algorithms and random forest models. The purpose of this paper is to introduce the use of fuzzy feature selection methods using R software. The method in this paper selects the most important variables influencing prediction of a target variable by quantifying the inherent uncertainty expressed by clinicians in linguistic terms.

Method: This method can be used with self-reported variables and experts' opinions in the field or combinations of them. The first step is to measure the features, the second step is compute the mean of the quantitative measures, the third step is to fuzzify the means based on triangular fuzzy numbers (TFNs) which are defined based on experts' opinion. The fuzzy numbers are then analyzed using the Fuzzy WASPAS Method. This method identifies the most important features and their weights. The Fuzzy MCDM package in R is used. As a case study in this paper, 7 features (age, sleep, diet, family support, emotion regulation, history of trauma, physical exercise) which have an impact on mild cognitive impairment were measured based on 3 criteria including the opinions of 6 psychiatrists', 5 psychologists and 3 neurologists. The data were collected by structured interview and they were measured based on 5-point Likert scales (1=very low, 2 =low, middle=3, high=4 and very high=5). The means of the features were defined as triangular fuzzy numbers and using the fuzzy WASPAS method the weights and importance ratio of the features were computed. Each feature was either cb(i)='max' if the i-th criterion was a benefit or cb(i)='min' if the i-th criterion was a cost. Lambda was 0.5.

Results: The results indicated that age, diet, emotion regulation, family support, physical exercise, history of trauma and hours of sleep were the most important features, in that order, with variables given higher weights having a larger impact on mild cognitive impairment in epilepsy's disease.

Conclusion: Using this Fuzzy feature selection method we can combine information from different types of qualitative (linguistic terms) and quantitative data when selecting the most important features. This method can be regarded, therefore, as a semi qualitative feature selection method.

Keywords: Epilepsy's disease; Feature selection; Fuzzy theory; Methodology

Joint Event

11th World congress on
**Addictive Disorders &
Addiction Therapy**

3rd International Conference on
Epilepsy Research and Treatment

September 12-13, 2022

WEBINAR

Biography

Hojjatollah Farahani was born on September 23, 1978 and he is an Assistant Professor at the Tarbiat Modares University. He received his PhD in Psychology with Emphasis in Psychometrics from University of Isfahan and he was a postdoctoral fellow in Advanced Psychometrics under the supervision of Professor Miao, at Victoria University (Australia), where he started working on the uncertainty in causal inference. His research interests and directions include psychometrics, advanced behavioral statistics, innovative computational cognitive modeling, qualitative methodology, structural equation modeling and psycho-fuzzy modeling.