LITERATURE SURVEY

TOPIC :

AI – POWERED NUTRITION ANALYZER FOR FITNESS ENTHUSIAST

TEAM :

19IT053 – MALATHY G

19IT069 – PRIJITHA S

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19IT106 – SUJATHA K

1)Title : Artificial Intelligence in Nutrients Science

Authors : Magdalena Suchodolska , Jarosław Sak

Link :
https://pdfs.semanticscholar.org/5c52/6d51fba02228122897518e6679b85067dc13.pdf

INTRODUCTION :

ABSTRACT :

The possibilities of artificial intelligence in the field of medical diagnostics, risk prediction and support of therapeutic techniques are growing rapidly. The aim of the article is to analyze the current use of AI in nutrition science research. It was found that the artificial neural network (ANN) methodology was dominant in the group of research on food composition study and production of nutrients. However, machine learning (ML) algorithms were widely used in studies on the influence of nutrients on the functioning of the human body in health and disease and in studies on the gut microbiota

METHODS:

In the area of biomedical nutrients research, there were identified studies in which advanced AI methods and systems were applied in relation to the study of the composition of food products, optimization of nutrient production, the effects of nutrients

on the functioning of the human body in health and disease and research on the gut microbiota.

TOPIC	NUTRIENTS	DOMAIN	ALGORITHMS
Food composition	Proteins, Minerals (K, Ca, Mg), Trace elements	ANN, ML	SVM, LS-SVM, SVR, GA-RBFN, PLS, GA-PLS, KohNN, LASSO, CLAs
Production of nutrients	Retinol, Benzoquinones, Phycobiliproteins	ANN, FLM	LM, GA, ANN-GAR, FFD, GA-Fuzzy
Influence of nutrients on phys./path. functions	Proteins, Vitamins (A,B,C,D,K)	ANN, FLM, ML	SVM, BN, NB, RF, CLAs
Gut microbiota	Nutrients from food	ML, NV	SVM, kNN, RF, CLAs

According to graphical characteristics of the analyzed works , the ANN methodology dominated both in food composition study and the production of nutrients. Among the works on the influence of nutrients on the functioning of the human body in health and disease and studies on the gut microbiota, ML domain algorithms were used almost exclusively. The fuzzy logic methodology was used occasionally.

RESULTS :

The use of AI in biomedical nutrients research reflects the need for efficient analysis of large datasets that could not be analyzed using traditional statistical methods. This applies in particular to the study of the relationship between nutrients and the functioning of the human body and in the study of the gut microbiota

2) Title : The Intention to Use Fitness and Physical Activity Apps: A Systematic Review

Authors : Salvador Angosto , Jeronimo Garcia-Fernandez , Irena Valantine and Moises Grimaldi-Puyana

Link : https://www.mdpi.com/2071-1050/12/16/6641/pdf

The aim of this study is to perform a systematic review of the literature on the intention to use mobile applications (Apps) related to fitness and physical activity by consumers. This systematic review is a critical evaluation of the evidence from quantitative studies in the field of assessment of consumer behavior towards sport applications . The continuous technological advances have awakened the interest of marketing researchers in the intention to use Apps, especially in the field of sports. Walter [64] explained the existence of a trend towards increased interest by fitness consumers in using Apps for exercise control. Therefore, the aim of this study was to conduct a systematic review of the literature on consumers' intention to use Apps related to fitness and physical activity.

3) Title : Use of artificial intelligence in precision nutrition and fitness

Authors : Maria Helena Baenade Moraes Lopes, Danton DiegoFerreira, Ana Claudia Barbosa HonórioFerreira, Giuliano Robertoda Silva, Aletha SilvaCaetano, Vitória Negri Braz

Link : Use of artificial intelligence in precision nutrition and fitness - ScienceDirect

Abstract:
The food pattern is one of the modifiable factors for improving lifestyle and disease prevention. It is known that changes in diet have an effect on the evolution of chronic noncommunicable diseases (CNCD) of high prevalence, such as obesity, depression, anxiety, type 2 diabetes, and cardiovascular diseases. In order to prevent the CNCD, changing eating habits is strongly recommended. In addition, physical fitness, through systematized physical activities or that increase daily caloric expenditure, also contributes to the prevention of CNCD. Precision medicine, or precise health, is an approach for disease treatment and prevention that considers individual variability in genes, environment, and lifestyle. The application of precision medicine has been broadly improved by the recent development of the large-scale biologic database, powerful methods for characterizing patients, and the use of high and smart technology. It is important to consider the computational tools for analyzing large data sets and, in this way, health-care providers will depend on electronic clinical decision support to quickly make appropriate treatment decisions. Computer systems that have a certain degree of intelligence and human/expert independence to infer about the preexisting data, in order to support the decision, could be useful, since the data generated require rapid and reliable analysis from a large number of variables. Among the available computational tools, artificial intelligence (AI) has gained more and more attention recently, since it is able to learn and model linear and nonlinear relationships between variables by constructing an input-output mapping such that hidden and extremely useful information for decision-making is revealed and interpreted. Although AI is not yet widely used in the areas of nutrition and fitness, it was found that the current technology available (information technology, several sensors, the use of nanotechnology and the advent of computers, IPhones, and smartphones) is favorable to the application of AI, since a large amount of data is collected by these technologies and, therefore, AI could be very useful in their mining. This chapter provides a discussion about the importance of nutrition and fitness for health and well-being; what is precision medicine, AI, precision nutrition, and precision fitness; how AI could help with precision nutrition and precision fitness; decision-making algorithm for nutritional meal planning/dietary menu planning; AI-based diet and supplements; AI used in genetic tests for precision nutrition and fitness; AI approach to nutritional meal planning for cancer, cardiovascular diseases, obesity, T2D patients; AI-based nutrition and fitness support systems and apps and some challenges and future perspectives.