



2687-5640

PREMIUM E-JOURNAL OF SOCIAL SCIENCES

Yıl / Year : 2021
Cilt / Volume : 6
Sayı / Issue : 19
ss / pp : 46-58

<http://dx.doi.org/pejoss.2220>
Araştırma Makalesi / Research Article
Makale Geliş / Received : 29.01.2022
Yayınlama / Published : 28.02.2022

Dr. Öğr. Üyesi. Özerk Yavuz
Nişantaşı Üniversitesi, İstanbul/TURKEY
<https://orcid.org/0000-0002-1371-688X>

DERİN ÖĞRENME, MAKİNE ÖĞRENİMİ VE VERİ MADENCİLİĞİ TEKNİKLERİ İLE SİGARA VE ALKOL İÇME DAVRANIŞLARININ VÜCUT TİPİ ÜZERİNDEKİ ETKİSİNİN ANALİZ EDİLMESİ

Özet

Sigara ve alkol kullanımı yüzyıllardır farklı birey, grup ve toplumlarda ortaya çıkan davranışlardan bazıları olmuştur. İnsanlar tarafından tütün ve alkol kullanımı birçok toplumda, coğrafyada ve kültürde görülen bir davranış biçimi olan çok eski yıllara dayanmaktadır. Literatürde sigara içmenin ve aşırı ve uzun süreli alkol kullanımının risklerini ve tehlikelerini vurgulayan çok sayıda çalışma bulunmaktadır. Aşırı ve uzun süreli alkol kullanımı ile ilgili birçok olumsuz sonuca rağmen, sınırlı ve orta düzeyde alkol kullanımının faydalarını vurgulayan ve alıntılaman bazı çalışmalar da mevcuttur. Bu çalışmada, liderlere ve genel olarak topluma içgörü sağlamak amacıyla derin öğrenme, makine öğrenimi ve veri madenciliği yaklaşımları kullanılarak çeşitli bireylerin vücut tipleri alkol ve sigara tüketim davranış kalıpları ile analiz edilmiştir.

Anahtar Kelimeler: Sigara Kullanımı, Alkol Tüketimi, Halk Sağlığı, Davranış teorisi, Derin Öğrenme, Veri madenciliği, Makine öğrenme

ANALYZING INFLUENCE OF SMOKING AND ALCOHOL DRINKING BEHAVIORS ON BODY TYPE WITH DEEP LEARNING, MACHINE LEARNING AND DATA MINING TECHNIQUES

Abstract

Smoking and drinking alcohol have been some of the behaviors that occurs in different individuals, groups and societies for centuries. Usage of tobacco and alcohol by human beings date back to old decades which is a form of behavior that is seen in many societies, geographies and cultures. There are numerous studies that highlight the risks and dangers associated with smoking and excessive and long term usage of alcohol. Despite the several negative consequences associated with excessive and long term usage of alcohol, there are some studies highlighting and citing benefits of alcohol usage in limited and moderate levels. In this study several body types of individuals have been analyzed with their alcohol and cigarette consumption behavioral patterns by using deep learning, machine learning and data mining approaches with the aim of providing insights for leaders and society at large.

Keywords: Smoking, Alcohol Consumption, Public Health, Behavior Theory, Deep Learning, Data Mining, Machine Learning

INTRODUCTION

“Without thinking and questioning, science does not exist.”

-Asst. Prof. Dr. Özerk Yavuz

“Culture is like a glue that holds the society together”

-Asst. Prof. Dr. Özerk Yavuz

“All sub-cultures in a melting cultural pot should respect each other for a peaceful society and world”

-Asst. Prof. Dr. Özerk Yavuz

“Nobody is asked about which country, race, colour and gender to born. So we should respect each and any one of us.”

-Asst. Prof. Dr. Özerk Yavuz

Smoking and drinking alcohol have been some of the behaviors that occurs in different individuals, groups and societies for centuries. Usage of tobacco and alcohol by human beings date back to old decades which is a form of behavior that is seen in many societies, geographies and cultures. There are numerous studies that highlight the risks and dangers associated with smoking and excessive and long term usage of alcohol. Despite the several negative consequences associated with excessive and long term usage of alcohol, there are some studies highlighting and citing benefits of alcohol usage in limited and moderate levels. In this study several body types of individuals have been analyzed with their alcohol and cigarette consumption behavioral patterns by using deep learning, machine learning and data mining approaches with the aim of providing insights for leaders and society at large [1, 17, 18].

As indicated by many notable scholars in literature, there are several antecedents that lead to a behavior to occur. These can be personal characteristics, past behavior, subjective norms, group norms, positive and negative anticipated emotions, personality factors, attitude towards smoking, attitude towards drinking alcohol, intention towards these behaviors, group influence, outcome expectations (personality, community related), norm of reciprocity, entertainment, purposive, self discovery, social enhancement values, trust, public relation and advertisement efforts, age, sex, religion, cultural norms, income, education status, occupation. As human nature suggests and indicated by several behavioral theorists in literature individuals engage in behaviors that are perceived to be rewarding, positive which provides financial or non-financial incentives and earnings whereas distract from behaviors that are perceived to be negative, risky and hazardous. Therefore public awareness on medical risks associated with smoking and alcohol drinking types of behaviors should be shared. Dangers associated with these behaviors should be highlighted in order to enhance the public awareness on potential risks associated with smoking and excessive, long term usage of alcohol [1, 17, 18].

Enforcing right behaviors and distracting dangerous risky behaviors with carrot and stick remains to be one of the old school methods and tools in this context. Today these types of behaviors are assessed and executed by court houses, law enforcement officers and law officers. Organisms favour pleasure whereas avoid pain in sustaining their lifecycles. However while doing this several life style choices, freedoms and preferences should be respected and preserved with the legislative actions, rules regulations and constitutions that respond to the universally accepted norms at the same time. Several sub cultures, life style preferences and choices in this context should not be punished because of their variabilities in their preferences in this context. All of the freedoms of the human kind needed to be

preserved and protected with the legislative actions and constitution in this context. In doing so right and hazardous behaviors should be defined within this perspective. For example behavior of killing an innocent person should be differentiated from smoking and drinking alcohol behaviors. While first is a form of a behavior which should not be tolerated in normal circumstances because of the fact that taking away of an innocent person's life, the second is a type of personal preference and life style choice despite its negative consequences on the human health. Similarly having education in a higher education institute, sharing own ideas within respect framework, working in a job to sustain his/her life, raising, educating children, driving cars are all forms of behavioral types that are considered to be normal for the human kind and race. So regulatory frameworks, reforms, legislative actions should be formed and laws should be executed making these distinctions in every phase of legislative, executive and judiciary branches of the state [1,17,18].

There are several studies highlighting risks and dangers of smoking and drinking alcohol in literature. The health hazards of smoking cigarettes is many, composed of heart attack, erectile dysfunction, birth problems, tooth loss, addiction, stroke, dementia, aortic aneurysms, emphysema, asthma, lung infections, cancers of the mouth, throat, lung, and many other organs. There are several chemicals toxic and hazarding substances in cigarettes that leads to the malfunctions of several organs and systems in the human body. In the short term and long term usage of cigarette can lead to several health consequences, problems which may lead to system or organ irregularities or even death. When it comes to alcohol consumption, there are several risks and some benefits when used in moderate and limited levels in literature. Therefore consumption of alcohol is suggested to be moderate and responsibly if preferred as a life style or preference which should not be inferred as starting to drinking alcohol for nondrinkers. In literature while decreased risks of coronary heart disease, stroke, insulin sensitivity boost, reduced risk of heart failure, reduced risk of gallstones and increased HDL cholesterol are cited as some of the benefits there are severe risks and dangers associated with alcohol consumption such as hypertension, severe types of alcohol caused liver diseases which can lead to death, risk of cardiovascular diseases, liver inflammation, scarring of the liver (cirrhosis), alcohol caused fatty liver disease, heart muscle damage (cardiomyopathy), stroke, organ with system failures in several forms and various cancer forms (mouth, pharynx, Larynx, esophagus, breast, liver, colon and rectum), can trigger weight gains if not balanced with a diet, societal problems, violent crimes and alcoholism [1.2.3.4.7]. According to a longevity study of Brandt. in literature consuming 15 g/day of alcohol leads to longevity whereas higher and lesser amounts of alcohol leads to a shorter life span for the sample of the study. However this amount can provide severe risks for the people having liver malfunctions or other organ or system failures. Therefore it should be evaluated considering many parameters [1.2.3.4.5.6.7.8.9]. Despite some of the numerous benefits associated with alcohol consumption it is unfortunate to have the availability of a dense population combatting with alcohol addiction and its negative consequences. Therefore limiting or stopping alcohol intake, detoxification of the liver and metabolism with contemporary medical approaches, drinking moderate coffee, applying folate, curcumin, glutathione, vitamin c, vitamin b, sulphur, sistein, selenium cures are suggested for more sustainable liver functions in literature. Therefore these may be considered for more sustainable liver functions in consultation and suggested by the medical practioners. However preserving the health of the liver and metabolism by applying precautions, with life style changes may provide more benefits in the long run in comparison to treatment of anomalies in later stages [10. 11. 12. 13. 14. 15]. Individuals and metabolisms may react to the different doses of alcoholic beverages in several ways. Therefore metabolic differences, several factors like age, sex, weight, height, metabolic rate other medical conditions associated with individuals should be considered and it should be drincken responsibly. In this context for the consumers who prefers to consume alcohol it is suggested to consume in moderation and limited with the right dose in consultation and suggested by their doctors. Public relations and advertisement campaigns in highlighting the health risks of alcohol and cigarette consumption should be prepared to enhance and raise awareness of the public on the phenomena and negative consequences that may arise from alcohol or cigarette consumption. In consuming these substances, always a medical specialist view should be considered beforehand and a health management plan should be planned for

every distinguished individual of the society in preserving the health of the society and human kind [1, 17, 18].

RESEARCH APPROACH

In this research a data mining research methodology composed of supervised and unsupervised methodologies involving deep learning techniques have been applied. Data mining is defined as a methodological approach in quantitative data analysis as indicated in literature. Data mining process is composed of some set of structured steps that makes the data mining research process and methodology. Initially understanding and analysis of the situation and business problem is completed which is followed with the examination and pre-processing of data. Later a conceptual framework or model is devised following the literature review and analysis approaches. Testing of the model with supervised and unsupervised versions of machine learning approaches takes place. Finally predicted analysis results are evaluated and assessed [9, 10, 11].

Data mining has been one of the popular research forms that is heavily and frequently used in several sectors and industries as marketing, healthcare, politics, telecommunication, banking and retail. Data mining approach can be considered as a systematical, structured research process which focuses on situation analysis, data gathering, model formation and testing of the model. Later findings and knowledge discovered from these analyses can be used as a decision support point for leaders, science community and society at large. Machine learning technique which is a famous approach in data mining based quantitative research methodologies is a form of learning in machine forms. This learning process is usually triggered and activated by forward feeding approaches which is later followed with backpropagation processes which are stochastic in nature. With the help of mapping functions input layers in the model are mapped to the output layer considering the independent, dependent values. Functions and equations involved in this mapping are calculated. Later in many forms rules generated with the least error rate and which provides the most proximity to actual results are selected and presented as the distinctive association rules. In the evaluation of this a stochastic backpropagation technique is used in many cases. Supervised learning and unsupervised learning are two forms of machine learning in data mining. Supervised learning is a form of classification approach where input and output layer mappings are done with the transformation functions, with the aim of rule discovery and insights discovery. A stochastic backpropagation technique is used in this type of machine learning in general. In the mapping process independent multivariate variables are assigned to the respective class labels which are considered as the dependent variables in the output layer. Since the initial labeling of the dependent values in the form of nominal values technique, this type of machine learning is named supervised machine learning. On the other hand in unsupervised machine learning several attributes of different instances are assigned to respective clusters with respective values without the requirement of an initial class label declaration. In this form of machine learning several mathematical and statistical functions utilizing heuristics in many cases are applied. In most of the clustering analysis which is also known as unsupervised machine learning centroid values for each independent cluster is calculated and related attribute values for several instances in the data set are assigned to the cluster with the focus on similarity and convergence maximization in one cluster and divergence, difference maximization with other cluster members having other centroid values. In deep learning which is a form of machine learning, feature extraction and classification is integrated in labeling the association rules. In contrast to traditional machine learning algorithms, in deep learning new associations and features are formed and discovered based on early input values in the latent neurons which is followed with a classification approach in an integrated way. Following the feature extraction and classification steps association rules are assigned to the respective class labels in the model training later the model is tested as in the conventional machine learning approaches. Deep learning can be in the form of supervised, unsupervised or semi supervised fashion. Multilayer Perceptron, Bayesian Networks, D14jMlpClassifier (Deep Learning), OneR Method, Hoeffding Tree, Random, Tree, Kmeans have been some of the mostly cited supervised and unsupervised machine learning techniques which utilizes different classification and clustering approaches in literature . Machine learning utilization of data mining can provide exploratory and confirmatory understanding in the phenomena in question and may provide insights and in-depth understanding with knowledge

discovery, prediction or forecasting option it provides. In this context a data mining approach strengthened with deep learning techniques have been employed to understand phenomena [9, 10, 11].

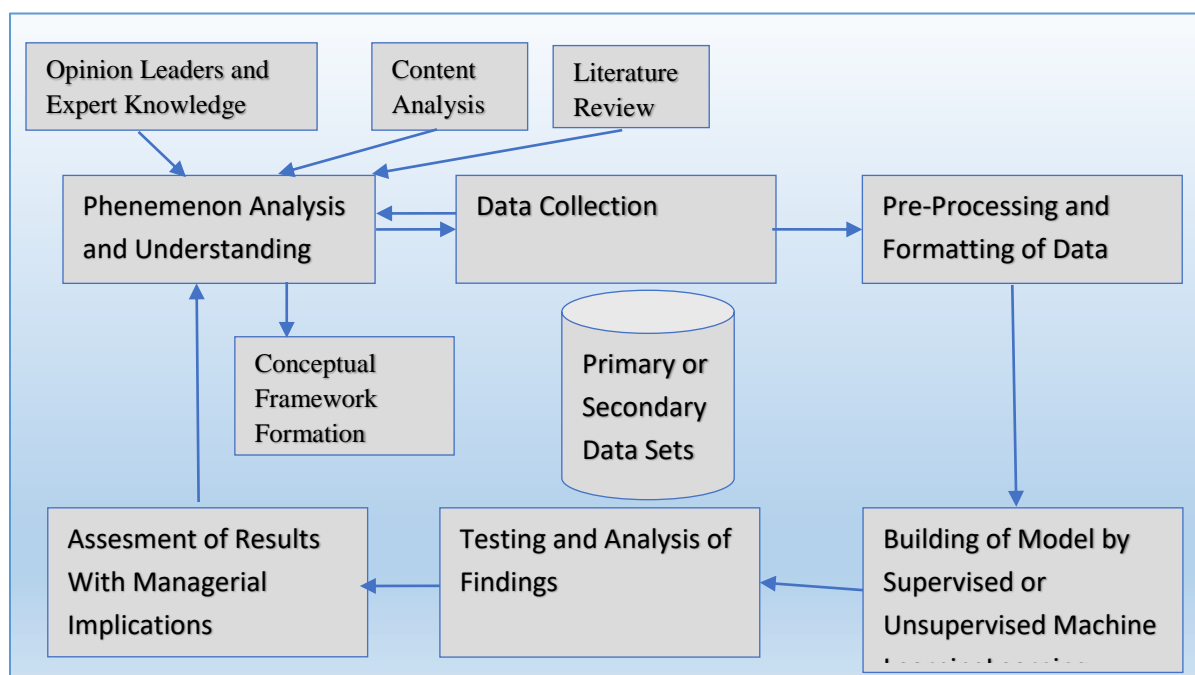


Figure 1. Data Mining Process (Prepared by the Researcher)

In the analysis part, Multilayer Perceptron, Bayesian Networks, D14jMlpClassifier (Deep Learning), OneR Method, Hoeffding Tree, Random, Tree, Kmeans were used for machine learning techniques. . The unsupervised machine learning algorithms here evaluate sample values and assign these individual values to sets of relevant segments, while the supervised machine learning algorithms mainly focus on mapping multivariate variables in the input layers to output class labels using transform and mapping functions which is followed by stochastic backpropagation techniques in many cases. In the analysis part the performances of various machine learning approaches are compared and rules with rule functions are built in a reinforced manner, some of them applying forward and backward propagation approaches, depending on their algorithmic architectures and designs [9, 10, 11, 12, 13, 14]. Depending on various factors, such as algorithmic design, algorithmic architecture, algorithmic complexity, these algorithms can produce different results for similar, same or different problem sets and domains [9, 10, 11, 12, 13, 14]. The performance indicators of the algorithms were evaluated and evaluated using the same parameter values with the same data set. With the analyzes performed, the algorithm with the top performer score was discovered with the same data set and parameters maintained. The information patterns and the rules found are listed following the interpretation phase of the research.

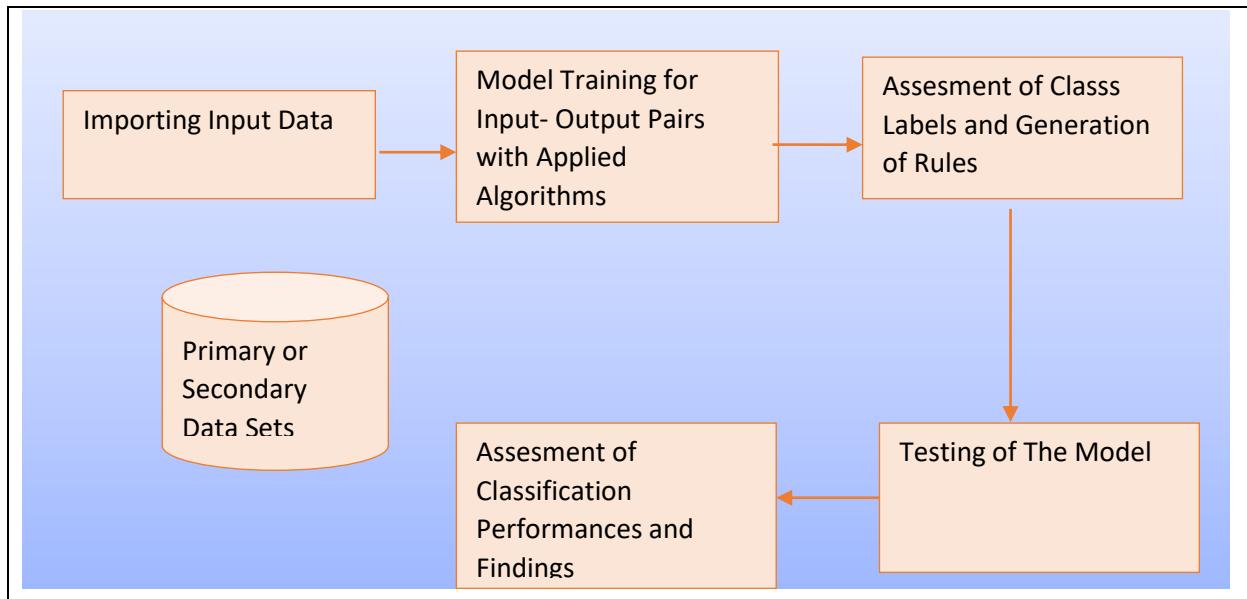


Figure 2. Supervised Machine Learning Process (Prepared by the Researcher)

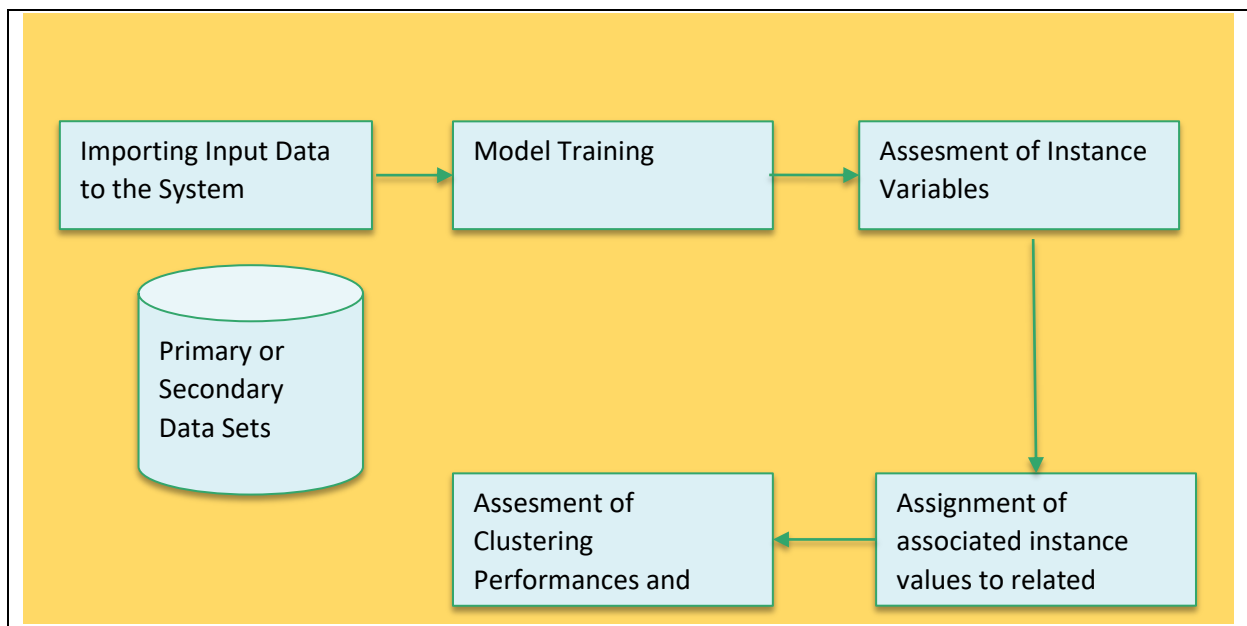


Figure 3. Unsupervised Machine Learning Process Composed of Model Building and Testing (Prepared by the Researcher)

For data set an online administred survey has been conducted using a snowball sampling process [9, 10, 11, 12, 13 ,14].

Table 1. List of Attributes

Gender	Nominal
Smoking Behavior	Nominal
Drinking Alcohol Behavior	Nominal
Body Type	Nominal
Income	Nominal
Age	Nominal
Education Status	Nominal
Sexual Orientation	Nominal

ANALYSIS RESULTS

It is known that data mining is one of the important research methodologies applied in today's contemporary world in order to gain insights and knowledge associated with several phenomena. As Özerk asserts in his notable study, many data mining processes today apply a technical approach in supervised learning where independent or multivariate indicators and variables are assigned to output class labels using functions of mapping. In unsupervised versions of data mining and machine learning, the core values of each cluster (centroids) are calculated, the corresponding sample and attribute values are assigned to the respective clusters so as to maximize convergence and minimize differences in the same cluster, whereas a divergence is expected with the members of different clusters. In the process of supervised and unsupervised machine learning, rules are created to improve the exploratory and confirmatory understanding of the phenomenon [9, 10, 11, 12, 13, 14]. In this context, an Aristotelian research design path can bring several advantages in understanding these phenomena and can be a good decision support tool for key business leaders, political leaders and society in general.

In data mining analysis, association rules, knowledge and understandings are discovered with the help of classification and clustering algorithms for the relevant problem set and domain. In these approaches, input-output mapping functions are used to create association rules that map the outer layer to the inner layer. In some, feed forward and back propagation techniques have been applied. The relevant rules with the least error rate are presented as the main rules of the analysis [9, 10, 11, 12, 13, 14].

The same input load with the same parameters was tested using machine learning algorithms, Multilayer Perceptron, Bayesian Networks, D14jMlpClassifier (Deep Learning), OneR Method, Hoeffding Tree, Random, Tree, Kmeans. The University of Waikato's Weka data mining package, which includes supervised and unsupervised machine learning applications, was used in the analysis. Then, the performance of classification and clustering was compared and evaluated. In the analysis, 10 fold cross validation method has been used to train and test the model. Based on the performance indicators associated with the data mining analysis, a high performance algorithm was chosen and can be used for such areas and sets of problems to gain additional insight and insight. For this purpose, values of mean squared error, precision, correct classification rate and misclassification rate were used [9, 10, 11, 12, 13, 14]. The analysis revealed the performance indicator values and rules as in Tables 2 and 3.

Table 2. Performance Scores of Machine Learning Algorithms

Method Applied \ Performance Indicator	Random Tree	J48	Multilayer Perceptron	D14jMlpClassifier (Deep Learning)	Naive Bayes
RMSE	0.43	0.43	0.43	0.49	0.44
Correctly Classified %	81.25	75	81.25	81.25	81.25
Incorrectly Classified %	18.75	25	18.75	18.75	18.75

Table 3. Association Rules Generated by machine learning algorithms in data mining

If smoking status is no, alcohol drinking status is no and gender is Female then Fat. If smoking status is no, alcohol drinking status is yes and gender is Female then Fat. If smoking status is no, alcohol drinking status is no and gender is Male then Athletic. If smoking status is no, alcohol drinking status is yes and gender is Male then Athletic
If smoking status is yes, alcohol drinking status is no and gender is Female then Athletic. If smoking status is yes, alcohol drinking status is no and gender is Female then Athletic. If smoking status is yes, alcohol-drinking status is yes and gender is Female then Low Weight. If smoking status is yes and gender is male then Fat
If alcohol drinking status is yes then athletic, if alcohol drinking status is no then athletic
If smoking status is no then Athletic. If smoking status is yes then Fat
If university graduate then alcohol drinking status is no. If non-university graduate then alcohol drinking status is yes
If university graduate or non-university graduate then smoking behavior status is no
If income is in the range of 5000-10000 then alcohol drinking status is no
If income is below 5000 then alcohol drinking status is no
If income is above 10000 then alcohol drinking status is yes
For all income levels smoking status indicator is no
If married, single or divorced alcohol drinking status is no.
If having a relationship, alcohol drinking status is yes
If age is between 18-25 then alcohol drinking behavior occurs, if age is between 25- 60 or 60 and above then alcohol drinking behavior does not exist
For all age ranges smoking status indicator is no
If democrat, nationalist or conservative then alcohol drinking status is no
If liberal then alcohol drinking status is yes
If democrat, liberal or conservative then smoking status is no
If nationalist then smoking status is yes
If muslim then alcohol drinking status is no
If other then alcohol drinking status is yes or no
If Atheist then alcohol drinking status is yes
If Christian then alcohol drinking status is yes
If Muslim, Christian, Other or Atheist then smoking behavior status is no
If alcohol drinking status is no then smoking status is no
If alcohol drinking status is yes then smoking status is no
If smoking status is no then alcohol drinking status is no
If smoking status is yes then alcohol drinking status is yes
If Turkish Citizen then alcohol drinking status is no
If non-Turkish Citizen then alcohol drinking status is yes
If Turkish Citizen then smoking status is no
If non-Turkish Citizen then smoking status is yes
For Turkish citizens, in the cluster analysis it was revealed that both Turkish citizens with smoking behavior and Turkish citizens with alcohol drinking behavior exists

The analysis results revealed that, If smoking status is no, alcohol drinking status is no and gender is Female then Fat. If smoking status is no, alcohol drinking status is yes and gender is Female then Fat. If smoking status is no, alcohol drinking status is no and gender is Male then Athletic. If smoking status is no, alcohol drinking status is yes and gender is Male then Athletic. If smoking status is yes, alcohol drinking status is no and gender is Female then Athletic. If smoking status is yes, alcohol drinking status is yes and gender is Female then Low Weight. If smoking status is yes and gender is male then Fat. If alcohol drinking status is yes then athletic, if alcohol drinking status is no then athletic. If smoking status is no then Athletic. If smoking status is yes then Fat. If university graduate then alcohol drinking status is no. If non-university graduate then alcohol drinking status is yes. If university graduate or non-university graduate then smoking behavior status is no. If income is in the range of 5000-10000 then alcohol drinking status is no. If income is below 5000 then alcohol drinking status is no. If income is above 10000 then alcohol drinking status is yes. For all income levels smoking status indicator is no. If married, single or divorced alcohol drinking status is no. If having a relationship, alcohol drinking status is yes. If age is between 18-25 then alcohol drinking behavior occurs, if age is between 25- 60 or 60 and above then alcohol drinking behavior does not exist. For all age ranges smoking status indicator is no. If democrat, nationalist or conservative then alcohol drinking status is no. If liberal then alcohol drinking status is yes. If democrat, liberal or conservative then smoking status is no. If nationalist then smoking status is yes. If muslim then alcohol drinking status is no. If other then alcohol drinking status is yes or no. If Atheist then alcohol drinking status is yes. If Christian then alcohol drinking status is yes. If Muslim, Christian, Other or Atheist then smoking behavior status is no. If alcohol drinking status is no then smoking status is no. If alcohol drinking status is yes then smoking status is no. If smoking status is no then alcohol drinking status is no. If smoking status is yes then alcohol drinking status is yes. If Turkish Citizen then alcohol drinking status is no. If non-Turkish Citizen then alcohol drinking status is yes. If Turkish Citizen then smoking status is no. If non-Turkish Citizen then smoking status is yes. For Turkish citizens, in the cluster analysis it was revealed that both Turkish citizens with smoking behavior and Turkish citizens with alcohol drinking behavior exists

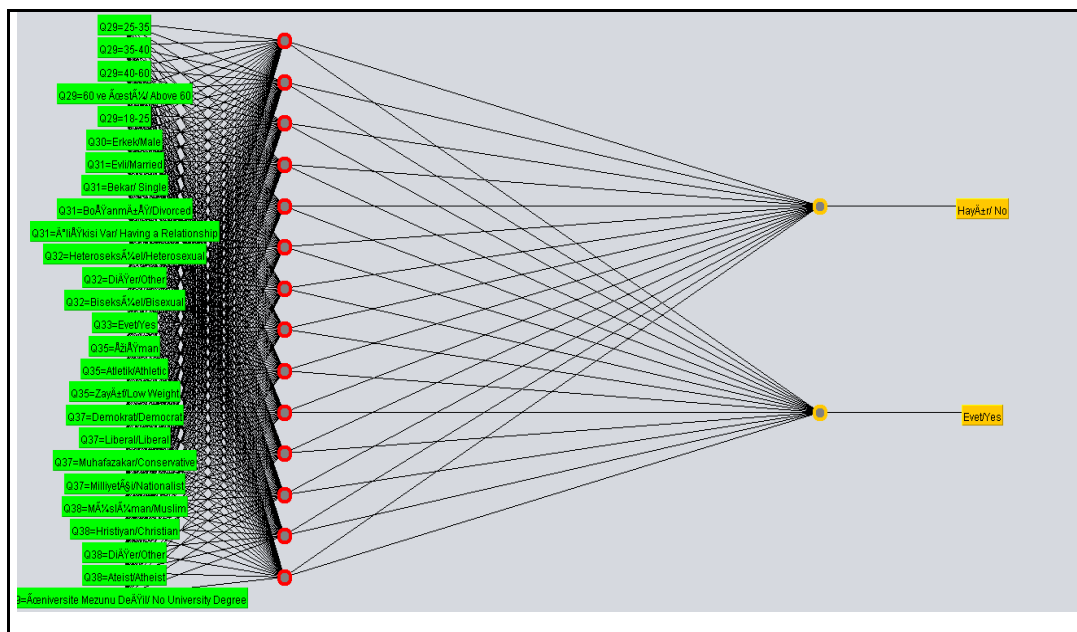


Figure 4. A Neural Network View of the Model Generated (Multi-Layer Perceptron- Purchase Behavior is the dependent variable)

Among several methods employed, Multilayer Perceptron and Random Tree methods have been the top performing algorithms with RMSE, correct classification and incorrect classification rates among other supervised machine learning approaches applied. To sum up, supervised and unsupervised machine learning algorithms, which are also known as classification and clustering techniques in data mining literature can be used as an effective and efficient tool for knowledge discovery or confirmation in exploratory and confirmatory research designs. These insights may be considered by decision makers and society at large in such problem sets and domains. Based on the input loads, algorithmic design, architecture and performance of the algorithm which can be assessed with approximations, metrics as Big O or Big Ω which are used to assess the efficiency and the computational complexity [9, 10, 11, 12, 13,14].

CONCLUSION

Smoking and drinking alcohol have been some of the behaviors that occurs in different individuals, groups and societies for centuries. Usage of tobacco and alcohol by human beings date back to old decades which is a form of behavior that is seen in many societies, geographies and cultures. There are numerous studies that highlight the risks and dangers associated with smoking and excessive and long term usage of alcohol. Despite the several negative consequences associated with excessive and long term usage of alcohol, there are some studies highlighting and citing benefits of alcohol usage in limited and moderate levels. In this study several body types of individuals have been analyzed with their alcohol and cigarette consumption behavioral patterns by using deep learning, machine learning and data mining approaches with the aim of providing insights for leaders and society at large.

The analysis results revealed that, If smoking status is no, alcohol drinking status is no and gender is Female then Fat. If smoking status is no, alcohol drinking status is yes and gender is Female then Fat. If smoking status is no, alcohol drinking status is no and gender is Male then Athletic. If smoking status is no, alcohol drinking status is yes and gender is Male then Athletic. If smoking status is yes, alcohol drinking status is no and gender is Female then Athletic. If smoking status is yes, alcohol drinking status is no and gender is Female then Athletic. If smoking status is yes, alcohol-drinking status is yes and gender is Female then Low Weight. If smoking status is yes and gender is male then Fat. If alcohol drinking status is yes then athletic, if alcohol drinking status is no then athletic. If smoking status is no then Athletic. If smoking status is yes then Fat.

If university graduate then alcohol drinking status is no. If non-university graduate then alcohol drinking status is yes. If university graduate or non-university graduate then smoking behavior status is no. If income is in the range of 5000-10000 then alcohol drinking status is no. If income is below 5000 then alcohol drinking status is no. If income is above 10000 then alcohol drinking status is yes. For all income levels smoking status indicator is no. If married, single or divorced alcohol drinking status is no. If having a relationship, alcohol drinking status is yes. If age is between 18-25 then alcohol drinking behavior occurs, if age is between 25- 60 or 60 and above then alcohol drinking behavior does not exist. For all age ranges smoking status indicator is no. If democrat, nationalist or conservative then alcohol drinking status is no. If liberal then alcohol drinking status is yes. If democrat, liberal or conservative then smoking status is no. If nationalist then smoking status is yes. If muslim then alcohol drinking status is no. If other then alcohol drinking status is yes or no. If Atheist then alcohol drinking status is yes. If Christian then alcohol drinking status is yes. If Muslim, Christian, Other or Atheist then smoking behavior status is no. If alcohol drinking status is no then smoking status is no. If alcohol drinking status is yes then smoking status is no. If smoking status is no then alcohol drinking status is no. If smoking status is yes then alcohol drinking status is yes. If Turkish Citizen then alcohol drinking status is no. If non-Turkish Citizen then alcohol drinking status is yes. If Turkish Citizen then smoking status is no whereas if non-Turkish Citizen then smoking status is

yes. For Turkish citizens, in the cluster analysis it was revealed that both Turkish citizens with smoking behavior and Turkish citizens with alcohol drinking behavior exists

Among several methods employed, Multilayer Perceptron and Random Tree methods have been the top performing algorithms with RMSE, correct classification and incorrect classification rates among other supervised machine learning approaches applied. To sum up, supervised and unsupervised machine learning algorithms, which are also known as classification and clustering techniques in data mining literature can be used as an effective and efficient tools for knowledge and pattern discovery as well as enhancing exploratory and confirmatory understanding for leaders and society at large in such phenomena.

Biography of Author



Asst. Prof. Dr. Özerk Yavuz received his Ph.D. degree in Business Administration-Marketing from Bahcesehir University, Istanbul, M.Sc. degree in Computer Engineering from Bahcesehir University, Istanbul and his B.Sc. degree in Computer Technology and Information Systems from Bilkent University, Ankara. Several papers and articles of him have been published in respected and prestigious refereed, international scientific journals, books, book chapters, conference proceedings and presented in international conferences and congresses. Dr. Özerk Yavuz also has been referee, reviewer, moderator or editor of several notable, trusted international scientific journals and international, scientific, academic books. He is interested in management information

systems, software engineering, computer engineering, data mining, virtual communities, virtual networks, marketing, management, and business administration. Dr. Özerk Yavuz has abroad and domestic working experiences in several institutions and countries, in various fields of business and higher education. He is interested in Salsa, Rumba, Cha-cha, East Coast Swing, Argentine Tango, American Tango, Vienna Waltz, Milonga and has been an active member of Bilkent University dance community. In his free time, he loves travelling, swimming and enjoying different kitchens. Dr. Özerk Yavuz has worked with several respected and distinguished scholars, leaders and teenagers in his work life. He has been a member of several distinguished scientific communities, Bilkent University and Bahçeşehir University alumni organizations. He is currently working in Nişantaşı University, Faculty Of Economics, Administrative and Social Sciences, Management Information Systems department as Asst. Prof. Dr. and continues his academic, administrative tasks.

Email: ozerk.yavuz@nisantasi.edu.tr; ozerk@alumni.bilkent.edu.tr; dr.ozerk@gmail.com

Personal Web Site: <https://sites.google.com/view/drozerkyavuz>

Orchid: <https://orcid.org/0000-0002-1371-688X>

Scopus: <https://www.scopus.com/authid/detail.uri?authorId=55371850200>

Google Scholar: <https://scholar.google.com/citations?user=hR7QJMAAAAJ&hl=en>

Publons: <https://publons.com/researcher/4754966/dr-ozerk-yavuz/>

Researchgate: <https://www.researchgate.net/profile/Oezerk-Yavuz>

REFERENCES

KOTLER, Philip (1991), **Principles of Marketing**, Englewood Cliffs - Prentice Hall, New Jersey (US).

KOTLER, Philip (2000), **Marketing Management**, Upper Saddle River - Prentice Hall, New Jersey (US).

MALHOTRA, Naresh K. (2007), **Marketing Research: An Applied Orientation**, Upper Saddle River - Pearson/Prentice Hall, New Jersey (US).

YAVUZ, Özerk (2009), “*An Early Warning System Approach for the Identification of Currency Crises*”, **Master Thesis**, Bahcesehir University Graduate School of Sciences, Istanbul.

YAVUZ, Özerk (2018), “*Marketing Implications of Participative Behavior in Virtual Communities*”, **Doctoral Thesis**, Bahcesehir University Graduate School of Social Sciences, Istanbul.

YAVUZ, Özerk (2021), **A Data Mining Analysis of Coronavirus Cases and Vaccinations in The City of London**, Astana Publisher, Ankara.

YAVUZ, Özerk (2021), “*A Public Perceptions Analysis with Data Mining Algorithms*”, **2. International “Başkent” Congress on Physical, Social and Health Sciences**, 25-26 September – Ankara, pp.69-73.

YAVUZ, Özerk, KARAHOCA, Adem and KARAHOCA, Dilek (2019), “*A Data Mining Approach for Desire and Intention to Participate in Virtual Communities*”, **International Journal of Electrical and Computer Engineering**, S.9(5), pp.3714-3719.

YAVUZ, Özerk (2021), “*A Leading Indicator Approach with Data Mining Techniques in Analysing Bitcoin Market Value.*” **European Journal of Science and Technology**.

YAVUZ, Özerk (2022), “*An Optimization Focused Machine Learning Approach in Analysing Arts Participative Behavior with Fine Arts Education Considerations.*” **International Scientific and Vocational Studies Journal**.

YAVUZ, Özerk (2022). “*A 21st Century Approach in Analysing Health Precautions in London with Machine Learning Driven Data Mining.*” **European Journal of Science and Technology**.

YAVUZ, Özerk (2022). “*Nitel ve Nicel Araştırma Tasarımı Uygulamasıyla Etanol Kullanımını ve Etkilerinin Anlaşılması.*” **European Journal of Science and Technology**.

YAVUZ, Özerk (2022). “*A Classification and Clustering Approach Using Data Mining Techniques in Analysing Gastrointestinal Tract.*” **International Scientific and Vocational Studies Journal**.

YAVUZ, Özerk. (2022). **Engineering & architectural Science - 2 (A Multidisciplinary Approach)**.

KARAHOCA, Dilek, KARAHOCA, Adem and YAVUZ, Özerk (2013), “*An Early Warning System Approach for the Identification of Currency Crises with Data Mining Techniques*”, **Neural Computing and Applications**, S.23(7-8), pp.2471-2479.

YAVUZ, Özerk (2021), **A Phenomenological, Single Case Study Approach in Analysing Health Considerations of Alcohol Drinking Behavior Seen In Adults**, Bilgin Kültür Sanat Yayınları

YAVUZ, Özerk (2021). “*Understanding Ethanol Usage and Its Influences by Applying a Qualitative and Quantitative Research Design.*” **European Journal of Science and Technology.**

<https://www.health.harvard.edu/mens-health/light-smoking-dangerous-in-any-dose>