KAPU
Trakya Mimarlık ve Tasarım Dergisi
Trakya Journal of Architecture and Design
https://dergipark.org.tr/tr/pub/kapu **ISSN: 2822-2423**

Review Article **5(2), 2025: 129 - 140**

THE USE OF THE SHAP ALGORITHM IN BUILDING ENERGY EFFICIENCY: A BIBLIOMETRIC ANALYSIS

Resul ÖZLÜK [1], Yusuf YILDIZ[2]
[1, 2] *Balıkesir Üniversitesi, Mimarlık Fakültesi, Balıkesir, Türkiye.*

ABSTRACT

The application of artificial intelligence algorithms as a method in energy-efficient building design is becoming increasingly important. Machine learning algorithms are used as an effective method for optimizing building energy consumption and creating prediction models. However, the interpretability and effective explainability of these artificial intelligence algorithms are limited. In studies conducted in the literature, the Shapley Additive Explanations (SHAP) algorithm enables the interpretation of these unexplained prediction models. Thus, it provides a powerful explanation of the effects of design variables. This study aims to provide researchers with a systematic review of the SHAP algorithm, one of the interpretable machines learning approaches, using a bibliometric approach in energy performance prediction and evaluation. In this context, 346 studies published between 2016 and 2025 were identified using the Scopus database in the first stage. Subsequently, only studies published in English were examined. A bibliometric analysis was conducted on 342 studies published between 2019 and 2025. The bibliometric analysis was performed using the VOSviewer software tool. This analysis evaluated the trends of the SHAP algorithm in the field of building energy efficiency in terms of countries, institutions, journals, author collaborations, publication years, and keyword relationships. The results of the study indicate that SHAP is becoming increasingly popular in the field of building energy efficiency and is being used in conjunction with different machine learning algorithms. This study aims to guide future research by revealing the current status and trends of the SHAP algorithm in the field of building energy efficiency.

Keywords: *AI algorithms, building energy efficiency,* explainable AI, *machine learning algorithms, SHAP algorithm.*

BİNA ENERJİ VERİMLİLİĞİNDE SHAP ALGORİTMASININ KULLANIMI: BİBLİYOMETRİK ANALİZ

ÖZET

Enerji verimli bina tasarımında yapay zekâ algoritmalarının uygulanması giderek daha önemli hale gelmektedir. Makine öğrenimi algoritmaları, bina enerji tüketimini optimize etmek ve tahmin modelleri oluşturmak için etkili bir yöntem olarak kullanılmaktadır. Ancak, bu yapay zekâ algoritmalarının yorumlanabilirliği ve etkili açıklanabilirliği sınırlıdır. Literatürde yapılan çalışmalarda, Shapley Additive Explanations (SHAP) algoritması, bu açıklanamayan tahmin modellerinin yorumlanmasını mümkün kılmaktadır. Böylece, tasarım değişkenlerinin etkilerine ilişkin güçlü bir açıklama sunmaktadır. Bu çalışma, enerji performansının tahmini ve değerlendirmesinde bibliyometrik bir yaklaşım kullanarak, yorumlanabilir makine öğrenimi yaklaşımlarından biri olan SHAP algoritmasının sistematik bir incelemesini araştırmacılara sunmayı amaçlamaktadır. Bu bağlamda, ilk aşamada Scopus veri tabanı kullanılarak 2016 ile 2025 yılları arasında yayınlanan 346 çalışma tespit edilmiştir. Sonrasında, sadece İngilizce dilinde yayınlanmış çalışmalar incelenmiştir. 2019 ile 2025 yılları arasında yayınlanan 342 çalışma üzerinde bibliyometrik analiz yapılmıştır. Bibliyometrik analiz, VOSviewer yazılım aracı kullanılarak gerçekleştirilmiştir. Bu analiz, SHAP algoritmasının bina enerji verimliliği alanındaki eğilimlerini ülkeler, kurumlar, dergiler, yazar iş birlikleri, yayın yılları ve anahtar kelime ilişkileri açısından değerlendirmiştir. Çalışmanın sonuçları, SHAP'ın bina enerji verimliliği alanında giderek daha popüler hale geldiğini ve farklı makine öğrenimi algoritmalarıyla birlikte kullanıldığını göstermektedir. Bu çalışma, bina enerji verimliliği alanında SHAP algoritmasının mevcut durumunu ve eğilimlerini ortaya koyarak gelecekteki araştırmalara rehberlik etmeyi amaçlamaktadır.

Anahtar kelimeler: *Yapay zekâ algoritmaları, bina enerji verimliliği, açıklanabilir yapay zekâ, makine öğrenimi algoritmaları, SHAP algoritma.*

Sorumlu Yazar : Resul Özlük
Makale Geliş Tarihi : 23 Haziran 2025
Makale Kabul Tarihi : 23 Ekim 2025
DOI : 10.70370/ kapu.1725359
Makale Künye Bilgisi : Özlük, R., & Yıldız, Y. (2025). The Use of The Shap Algorithm in Building Energy Efficiency: A Bibliometric Analysis. *Trakya Journal of Architecture and Design*, 5(2), 129-140.

INTRODUCTION

In recent years, population growth has increased the rate of urbanization and social demand. With this increase, energy consumption, resource consumption, and high levels of pollution have become issues. With the increase in demand for energy in society and the depletion of fossil fuel resources, it is important to produce appropriate solutions for saving energy and reducing emissions (Chen et al., 2023). A large proportion of these problems are related to the construction sector. The transition to energy-efficient and sustainable buildings can play an effective role in preventing these problems. Furthermore, energy efficiency in buildings is crucial for minimizing operating costs. However, despite the accelerating use of renewable building technologies worldwide, faster changes are needed to align with net-zero emissions scenarios (Motuzienė et al., 2025). Therefore, studies on energy efficiency optimization in the construction sector have attracted the attention of researchers in recent years. A significant portion of these studies focus on different artificial intelligence algorithms used in building energy efficiency design and evaluation. Building energy consumption depends on numerous variables, including environmental parameters, user behavior, building materials, and the systems used in the building. The relationships between these parameters are complex and non-linear. Among the various artificial intelligence algorithms used in studies, Machine Learning (ML) algorithms are more successful than existing methods in modeling these complex relationships. ML algorithms can be used as an important tool in achieving sustainability goals such as ensuring user comfort, energy savings, and reducing carbon footprint. Therefore, model prediction and optimization, data-driven decision support systems, reduction of building energy simulation times, and the ability to work in real time with real-time data make machine learning algorithms a frequent choice in studies. Machine learning has been widely used in recent years to improve building energy efficiency by utilizing big operational data sets. However, most machine learning models are difficult to interpret and understand due to their black-box (unexplainable) structures.

Black box algorithms are closed to interpretation. An output is obtained from an input given to the algorithm, but the reason for this is not understood. The SHAP method makes machine learning models explainable by addressing their black box nature. The SHAP algorithm uses a game theory approach to interpret machine learning models. The Shapley value from classical game theory provides an explainable approach to describe the contribution of each input feature to the model output (Lundberg et al., 2017). To ensure interpretability, the SHAP algorithm, which incorporates model complexity and feature interactions, is frequently used in studies related to building energy consumption (Tzionis et al., 2025). Zhang et al., (2025), used a dataset on energy consumption in different buildings in conjunction with a new prediction method. This method involves a technique that combines different optimization algorithms and ML prediction methods. To make the study more interpretable, they developed different ML models using the SHAP algorithm. The results achieved high reliability in heating and cooling load prediction. Wang et al., (2025), evaluated the factors influencing energy-saving cognition-behavior gaps in a university dormitory. By comparing the performance of different machine learning algorithms, they determined the most suitable algorithm for the subject. They used the SHAP algorithm to determine the contribution of different parameters to the model. Alsamraee & Khanna (2025), present an advanced machine learning-based framework using energy consumption data from the University of Missouri campus. Different machine learning algorithms were trained within the scope of the study, and their performance was compared. Among these algorithms, the XGBoost algorithm had the lowest error rate and the highest reliability. Furthermore, SHAP was used to interpret model predictions, and the most important environmental parameters affecting energy use were identified. Korsavi et al., (2025), used energy consumption survey data to identify design parameters that influence residential energy consumption. In the study, machine learning algorithms were developed to estimate energy consumption, and SHAP analysis was performed to determine the importance of model parameters. Kangalli Uyar et al., (2025), predicted the Building Energy Performance Ratio (BEPR) of many residential buildings using different ML algorithms. The results show that XGBoost provides the highest accuracy among all machine learning models. Subsequently, to increase the interpretability of XGBoost, the effects of different parameters influencing BEPR were evaluated using the SHAP method. The analysis shows that the most influential factors in determining BEPR are the thermal properties of the building and the age of the building. Nguyen & Cao (2025), used green BIM and machine learning algorithms to estimate energy consumption in office buildings and found that XGBoost was the most successful model. Subsequently, the SHapley Additive exPlanations technique was used to analyze the effect of different parameters. The most important parameters affecting energy consumption were the number of floors, geographical location, and floor area.

The SHAP algorithm is also used in studies focusing on user comfort as well as energy consumption in buildings. Minassian et al. (2025), evaluated the performance of different algorithms using deep learning models to predict indoor environmental quality in smart buildings. They used SHAP analysis to identify the most effective features in the models' predictions. Li et al., (2025), provide a reliable model for predicting thermal comfort using a limited data set. They used SHAP analysis to determine parameters affecting thermal comfort, such as air velocity, average radiant temperature, and air temperature. The developed model showed high accuracy despite the limited data.

There are studies in the literature on the effect and interpretability of different input parameters (Cui et al., 2024). When these studies are examined, it is noteworthy that the SHAP algorithm is used to increase the interpretability of machine learning models used in building energy efficiency prediction and to select the main parameters affecting building energy consumption. It has been observed that the number of research articles on building energy efficiency based on explainable artificial intelligence (XAI) has increased in literature, but the number of review articles with systematic analyses is limited. Moreover, using bibliometric data, it has been observed that there are a limited set of review studies focusing on the use of the SHAP algorithm in the field of building energy efficiency and its recent development, which has become popular. This research presents a review of the use of the SHAP algorithm in building energy efficiency. It aims to provide guidance to researchers who wish to publish their work on the SHAP algorithm, which has been widely used in recent years for the prediction and optimization of building energy efficiency, as well as to offer a bibliometric and systematic perspective.

1. METHOD

There are studies that use bibliometric methods to analyze research conducted in the field of building energy efficiency. Examples of such studies include machine learning applications in building energy optimization (Liu & Chen, 2025), research on zero-energy buildings (Souley Agbodjan et al., 2022), and an examination of studies on embedded energy (Zeng & Chini, 2017). Bibliometrics is a method widely used in information science to evaluate the research performance of researchers. It uses statistical methods to analyze quantitative relationships and content information in a specific field (Geng et al., 2017). VOSviewer software was used to analyze the data used for bibliometric analysis. VOSviewer is a widely used scientific measurement software for summarizing and visualizing research-related data. This software creates various networks such as scientific publications, journals, keywords, countries, institutions, co-authorship, and citation maps. It then analyzes the relationships and connections between the data in the created networks (Abdelaziz et al., 2021; Kemeç & Altınay, 2023). In the studies, it was observed that the VOSviewer software analyzed the data related to the subject and revealed the trends of researchers in a specific field. Within the scope of the study, data from the Scopus database was used to perform bibliometric analysis using VOSviewer software. As shown in Table 1, the publications related to the subject were filtered by searching for the title, abstract, and keywords from the sample query in the Scopus database.

Table 1. Summary of the systematic search of the Scopus database used in the study.

Literature database	Date	Study eligibility criteria	Number
Scopus	26.09.2025	(TITLE-ABS-KEY (“SHAP” OR “SHAP algorithm” OR “Shapley Additive exPlanations” OR “explainable AI” OR “XAI”) AND TITLE-ABS-KEY (“energy efficiency” OR “building energy” OR “energy”))	346

First, the analysis was conducted on a total of 346 documents published between 2016 and 2025. The filtering process was limited to publications in English, resulting in 342 results. After this filtering process, the publications cover documents from 2019 to 2025.

2. RESULTS AND DISCUSSION

Studies on the use of the SHAP algorithm in building energy efficiency have continued to increase from 2019 to 2025. The graph shows that the lowest number of publications occurred in 2019 and 2020. A significant increase in the number of studies is observed from 2022 to 2025, with 2025 being the year with the highest number of studies on the subject (Figure 1). These results indicate that the use of the SHAP algorithm in the literature on building energy efficiency has increased in recent years.

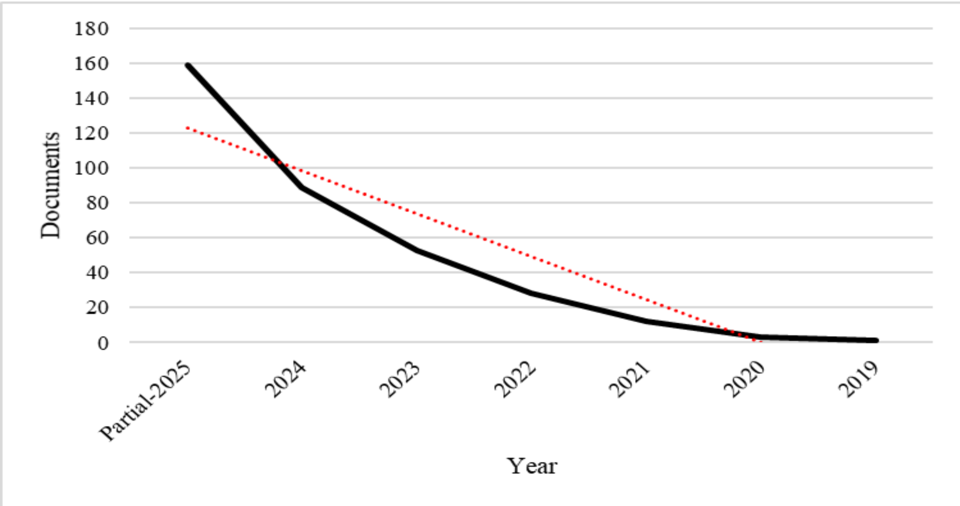

Figure 1. Annual distribution of publications in the literature.

These studies have been published in various types of publications, such as articles, book, book chapter, conference review, conference papers, and reviews (Figure 2). The fact that most of the studies were published in the "article" category shows that the SHAP algorithm has been used in peer-reviewed journals for comprehensive research in the field of building energy efficiency. The low percentage of publications in the review category confirms that there are gaps in studies related to literature analysis.

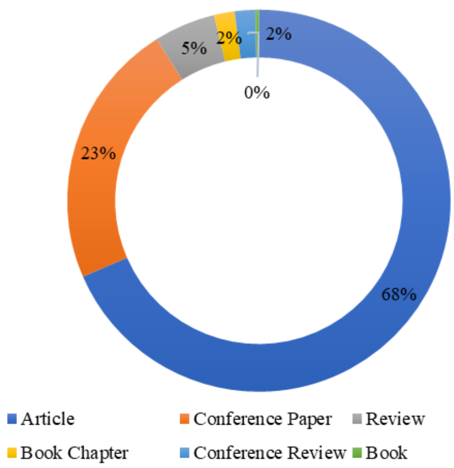

Figure 2. Distribution of publication types related to studies conducted in literature.

Table 2 shows the top 10 institutions conducting research on the subject, their countries, and the number of publications. Institutions affiliated with China, such as the Ministry of Education of the

People's Republic of China, Chongqing University, Southeast University, Xi'an University of Architecture and Technology, Tongji University, Huazhong University of Science and Technology, and Hunan University, stand out. The fact that most of the institutions on the list are universities indicates that the SHAP algorithm is used in building energy efficiency, particularly in academic fields. Furthermore, institutions in countries such as the United Kingdom and Germany are also engaged in work in this area. This result highlights the universality of the studies conducted on this subject.

Table 2. Publication analysis by affiliation.

Affiliation	Country	Documents number
Ministry of Education of the People's Republic of China	China	8
Chongqing University	China	8
Southeast University	China	6
Xi'an University of Architecture and Technology	China	6
Tongji University	China	6
City University of Hong Kong	Hong Kong	5
University College London	United Kingdom	5
Huazhong University of Science and Technology	China	5
Hunan University	China	4
Fraunhofer Institute for Applied Information Technology FIT	Germany	4

The percentage distribution of SHAP algorithm research in the field of building energy efficiency is shown in Figure 3. The distribution covers the majority of studies in the fields of engineering (33%), computer science (18%), and energy (12%). Environmental sciences (10%) and mathematics (9%) follow these fields. The fact that different disciplines use the SHAP algorithm indicates that studies on the subject are not limited to specific disciplines.

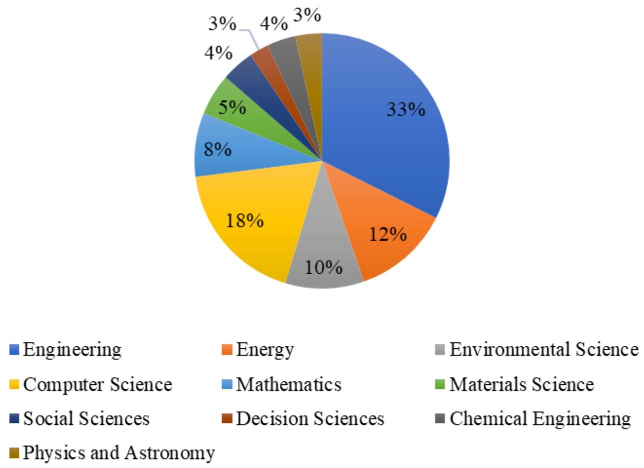

Figure 3. Distribution of subject areas related to studies conducted in literature.

The distribution of the articles examined in the study according to the journals in which they were published is shown in Table 3. Upon examination of the table, it can be seen that studies on the subject are published in international journals in different sectors. The journals listed in the table account for 30.34% of the studies on the subject. Journals such as Energy and Buildings (27), Energy (14), Applied Energy (12), Journal of Building Engineering (12), and Building and Environment (11) stand out in studies on the subject. The high number of publications in these journals confirms the importance of the SHAP algorithm in the field of energy. Additionally, journals such as IEEE Access, Energies, Lecture Notes in Networks and Systems, Sustainability Switzerland, and Applied Sciences Switzerland also stand out as important journals in this field. This situation, where the SHAP algorithm is published in journals from different disciplines, demonstrates the algorithm's potential for application in various fields.

Table 3. Journals in which the articles were published.

Source	Documents number
Energy and Buildings	27
Energy	14
Applied Energy	12
Journal of Building Engineering	12
Building and Environment	11
IEEE Access	8
Energies	7
Lecture Notes in Networks and Systems	5
Sustainability Switzerland	5
Applied Sciences Switzerland	4

- **Publication Distribution by Countries**

When we examine the distribution of research on building energy efficiency by country using the SHAP algorithm, China is the country with the most publications in this field, with 93 publications. The United States ranks second with 48 publications, while India ranks third with 38 publications. The fact that different countries such as United Kingdom (27) Germany (26), South Korea (23), Türkiye (19), Italy (19), and Saudi Arabia (16) have conducted studies demonstrates that the SHAP algorithm is used in academic studies on a global scale. Figure 4 represents a map created using VOSviewer software, showing the intensity of cooperation among countries working on the SHAP algorithm in the field of building energy efficiency. The central position of China and the United States on the map confirms that these two countries are leaders in research in this field. Table 2 shows that Chinese institutions have a large number of publications in this field, supporting China's leading position. The increase in energy consumption in China, coupled with intensive energy efficiency policies and incentives for academic institutions working in this field, are possible reasons for this. Furthermore, advances in artificial intelligence in these two countries may also contribute to their leading positions.

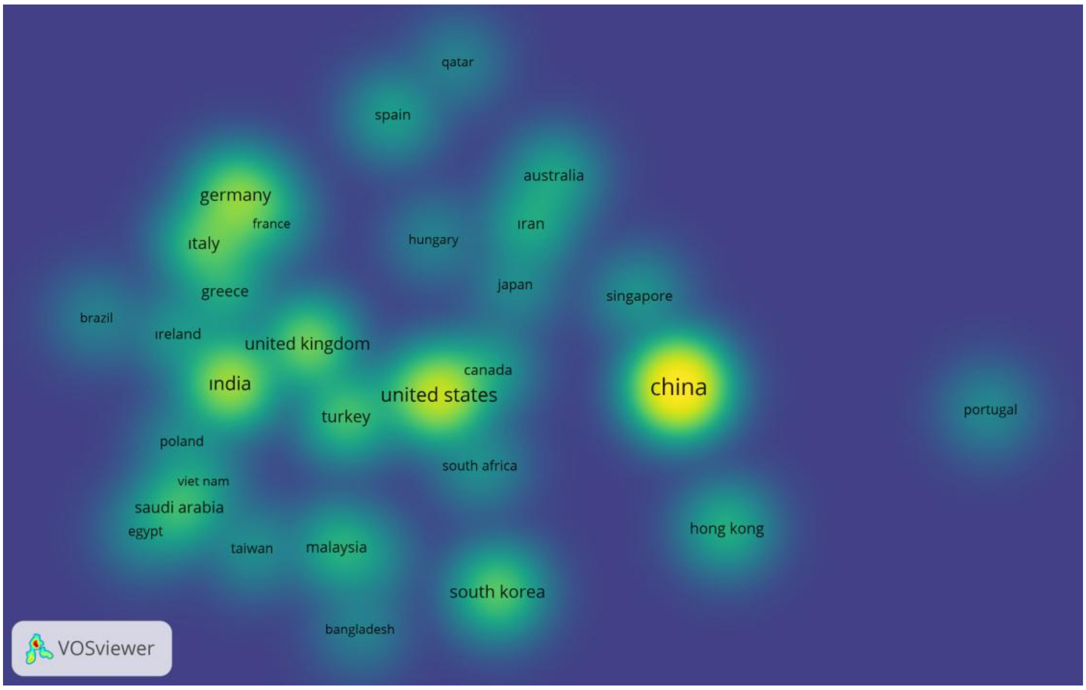

Figure 4. Cooperation of the countries.

- **Publication Distribution by Authors**

Fifteen authors who contributed to studies on this topic stand out with a maximum of two publications. Chen Z. et al. (2025), are the most cited authors in this field with 180 citations. According to Figure 5, the nodes represent the authors, and the connections show the most connections between these authors. The size of the nodes indicates the citation weight of the authors. Additionally, Chen Z. et al. (2025), have been the most collaborative authors with a total of eight connection strengths each.

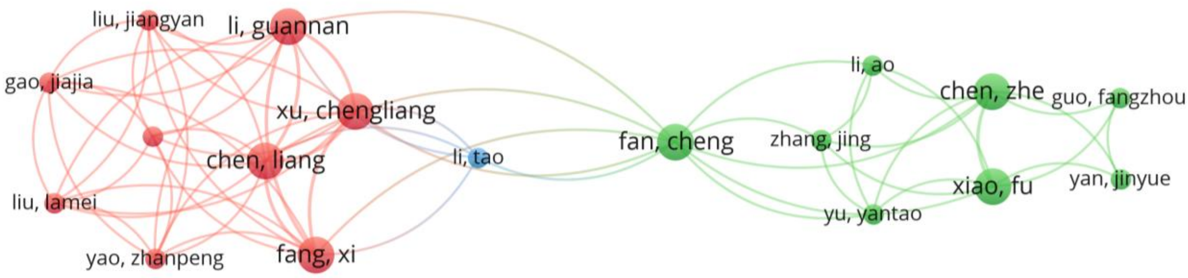

Figure 5. Collaborations between authors based on quotations.

- **Analysis of Words Used in the Title Section**

The frequency of use of the main keywords in the titles and their connections to each other, determined as a result of the content analysis, are shown in Figure 6. Figure 6 shows that the frequent use of the terms “machine learning,” “energy,” “consumption,” and “explainable artificial intelligence” in the title section confirms the accuracy of the study's research scope and focus. Machine learning approaches are frequently used in predicting energy consumption. This indicates that machine learning algorithms are primarily applied in non-linear energy consumption modeling. However, these models have a black box structure. The term “Explainable Artificial Intelligence” has been widely used in studies to explain machine learning models with a black box structure. This confirms that researchers are working on the explainability of machine learning models. The frequent use of the term “residential building” indicates that a significant portion of studies related to energy consumption are based on residential buildings. Focusing on the terms used in the title section, it is seen that different machine learning approaches are used to predict energy consumption, and Explainable Artificial Intelligence (XAI) methods are used to interpret and explain these approaches.

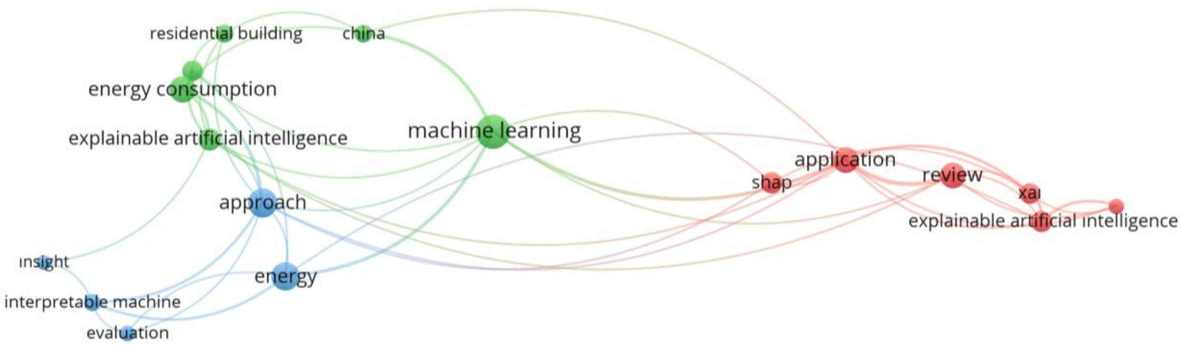

Figure 6. Relational network representation of the key words determined as a result of the title analysis.

- **Analysis of Author Keywords**

The density of keywords used in the studies examined in this study is shown in Figure 7. Density analysis reveals the focus and trends of the studies (Hatami et al., 2022). When analyzing the prominent keywords, the use of terms such as "building energy" and "energy efficiency" indicates that the studies mostly focus on building energy performance. The analysis confirms that terms such as "neural network," "deep learning," and "machine learning" are widely used in studies on deep learning and machine learning techniques. In particular, machine learning algorithms such as decision trees, artificial neural networks, deep neural networks, gradient boosting, and random forests are seen to be used in building energy consumption estimation and building energy performance evaluation. In addition to these methods, the interpretability of the SHAP algorithm has also been examined, and terms such as "shap(ley)", "explainable artificial intelligence (xai)", and "interpretable machine learning" have been used in conjunction with machine learning algorithms to evaluate building energy consumption. The multiple occurrences of the term "SHAP," which is short for "Shapley additive explanations," confirm that this study was reviewed with the correct keywords. The reviewed studies show that, in addition to machine learning algorithms, optimization-related studies also exist. Thus, the methods used in the studies demonstrate the use of multi-stage methods based on feature selection, machine learning, and optimization algorithms. Furthermore, some studies have focused on user comfort and other aspects of sustainability along with energy consumption. This proves that multi-objective optimization studies also exist.

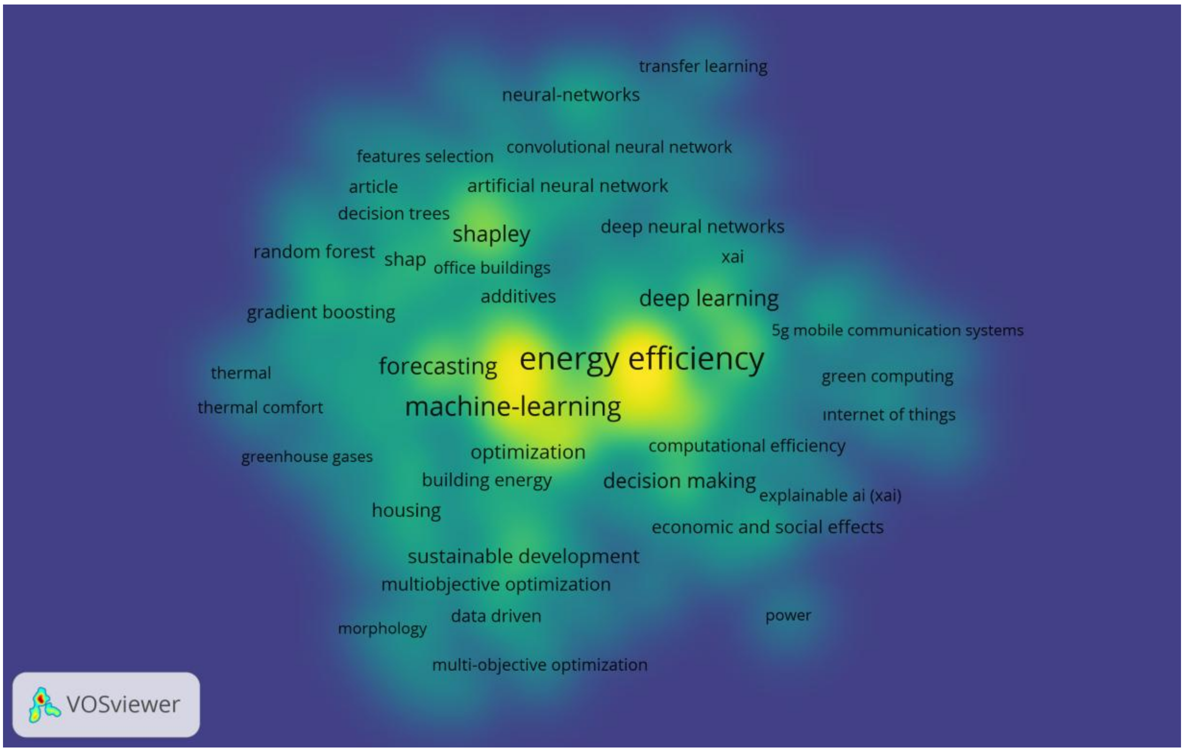

Figure 7. Keyword density diagram.

- **Analysis of Words Used in the Summary Section**

The diagram, explanation, SHAP analysis, Explainable Artificial Intelligence, and terms such as different machine learning algorithms and structures in Figure 8 demonstrate that they are appropriate for the purpose and focus of the study. The findings emphasize the importance of XAI approaches in this field, which centers on terms such as "explanation," "interpretability," and "SHAP analysis." Furthermore, it highlights the importance of the SHAP algorithm in interpreting the results of different machine learning models such as "random forest," "regression model," "knn," and "lightgbm." The connection between the terms SHAP analysis, design parameters, variable, and value indicate that this method is used in feature selection. The SHAP method assigns a value to each feature's contribution to a model's prediction and explains the features in an interpretable manner according to their order of influence. Thus, the effective features are determined in advance, enabling more effective building energy optimization. The connection between artificial intelligence terms explained in the network diagram, such as "energy performance" and "building energy performance," reveals that this algorithm is used in the evaluation and interpretation of energy analyses. Its use alongside metrics (RMSE) used to compare the performance of different algorithms demonstrates that the SHAP algorithm is used as a tool for evaluating different artificial intelligence algorithm models and comparing their performance.

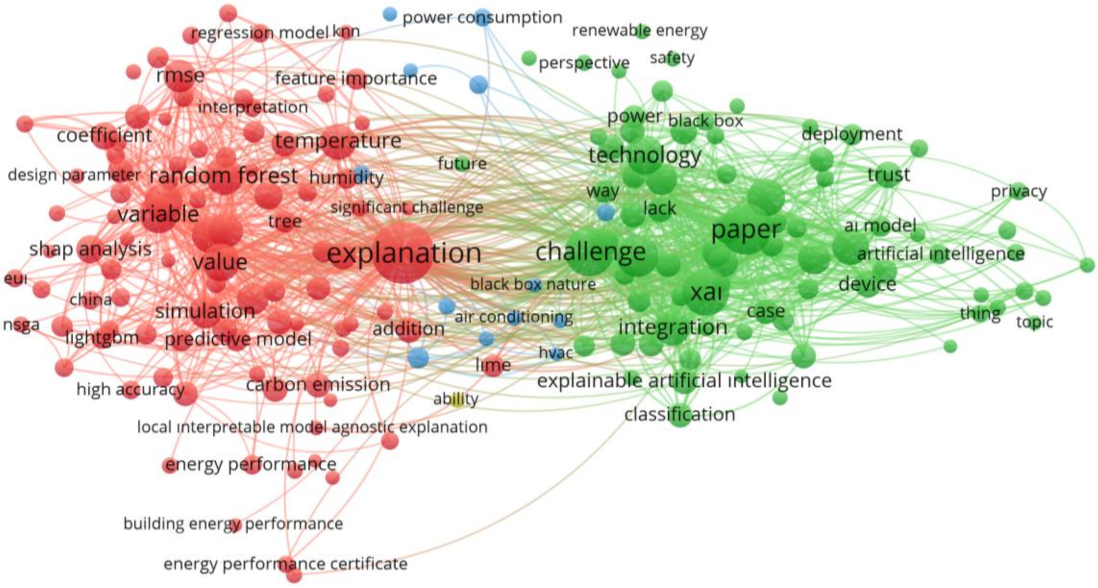

Figure 8. The word network in the abstract section.

3. CONCLUSION

This study provides a bibliometric analysis of the use of the SHAP algorithm in the field of building energy efficiency. The results of the study show that the SHAP algorithm has gained popularity in the field of building energy efficiency in recent years and has been applied in academic studies as an explainable machine learning model. The increase in the number of publications between 2016 and 2025 confirms the frequent use of SHAP in this field. Furthermore, some studies have been examined that focus not only on energy consumption but also on user comfort and other aspects of sustainability. In bibliometric analysis, China and the United States stand out as leading countries in this field. Both these countries' increasing research on artificial intelligence and their support for academic institutions on this subject set them apart from other countries. It has been observed that publications on this subject are mostly concentrated in the fields of engineering and energy. The fact that a large portion of publications appear in journals focused on energy and engineering confirms the algorithm's frequent use in applied fields.

Feature selection is commonly used as a preprocessing step in machine learning and also improves the performance of machine learning models. Findings indicate that the SHAP algorithm is used as an explainable artificial intelligence method to enhance interpretability in prediction models of machine learning algorithms and to determine the effect of variables on feature selection. The SHAP algorithm has been used in studies examined in the literature in conjunction with multi-stage methods that include optimization algorithms as well as machine learning algorithms such as gradient boosting, artificial neural networks, deep neural networks, decision trees, and Random Forest. SHAP enables the interpretation of the complex models of these algorithms, which have a black box structure. In analyses, keywords such as "energy efficiency," "building energy consumption," and "explainable AI" are frequently used. Furthermore, the use of this algorithm in comparing the performance of different black-box models shows that the SHAP algorithm can also be used as a tool for evaluating different artificial intelligence algorithm models. This algorithm can be used in real-time building management systems in conjunction with machine learning methods, and the performance of this integrated system can be tested and compared in different climate zones. Furthermore, thanks to the SHAP algorithm's ability to select features and reduce errors from the data obtained from the model, it can be integrated into energy simulation programs. This improves the duration and reliability of simulation models.

EXTENDED ABSTRACT

Research Problem & Purpose

In recent years, various machine learning algorithms have been frequently used in the evaluation and prediction of energy performance in buildings. Methods with black box models are generally used to interpret the results of these algorithms, and this situation causes difficulties for researchers in interpreting the results. In the literature, studies on the effect and interpretability of different input parameters are limited. The studies reviewed show that the SHAP algorithm is used to analyze the basic design variables that affect the energy performance of buildings and to facilitate the interpretation of machine learning models. XAI-based building energy efficiency research is on the rise. However, two important gaps are noted in the literature: (1) the lack of systematic review studies, and (2) the limited number of reviews that include a bibliometric analysis of the SHAP algorithm. This study aims to examine studies that evaluate building energy performance using the SHAP method in conjunction with different machine learning algorithms through bibliometric analysis. This study provides a methodological framework for researchers working in the field and highlights current trends in the field.

Methodology

Bibliometric methods were used to analyze studies conducted in the field of building energy efficiency. Bibliometric methods are widely used in information science to examine studies in the literature. Within the scope of this study, VOSviewer software was used to visualize and interpret the analysis of data used for bibliometric analysis. The VOSviewer software performed analyses using data obtained from the Scopus database. The study focuses on the analysis of a total of 342 publications across different disciplines.

Findings

The main findings of studies on the use of the SHAP algorithm in building energy efficiency are summarized below:

• *When studies on the subject are examined, it is seen that the use of the SHAP algorithm in the building energy efficiency literature has increased in recent years. These studies have been published in various types of publications, and most of the studies have been published in the "article" category. The low percentage of publications in the "review" category in particular highlights the importance of this study.*

• *Journals such as Energy and Buildings and Applied Energy stand out in studies related to this topic. The high number of articles published in these journals highlights the popularity of the SHAP algorithm in the field of energy. Furthermore, the fact that studies on the subject are published in journals belonging to different disciplines demonstrates the algorithm's potential for application in various fields.*

• *When examining the distribution of building energy efficiency studies by country using the SHAP algorithm, China and the United States stand out as the countries with the most publications in this field. Furthermore, the existence of studies on the subject in many different countries shows that the SHAP algorithm is used in academic studies on a global scale.*

• *When the keywords frequently used in the title section of publications related to the subject and the relationships between them are examined, the words "energy" and "consumption" stand out. This confirms that the main focus of the studies examined is energy consumption. The use of the terms "XAI" and "artificial intelligence" indicates that researchers are working on the interpretability of machine learning models and artificial intelligence algorithms.*

• *When the prominent keywords related to the subject are analyzed, the use of terms such as "building energy model," "energy efficiency," and "building energy consumption" indicates that the majority of the studies focus on building energy performance. In the analysis, the prominence of terms such as "ANN," "DL," and "machine learning" indicates that different artificial intelligence methods are widely used in studies evaluating building energy performance. The frequent occurrence of the SHAP method with most terms confirms that this study was analyzed with the correct keywords.*

• *In the abstract section, terms such as SHAP analysis, Explainable Artificial Intelligence, machine learning algorithms, energy consumption, and buildings are frequently used. The prominence of these terms indicates that the* *analysis aligns with the study's objectives. The findings emphasize the importance of XAI approaches in this field and focus on terms such as "explanation," "interpretability," and "SHAP analysis."*

Conclusions and Recommendation

This study provides an overview of the use of the SHAP algorithm in building energy efficiency. The study demonstrates that SHAP can be used in conjunction with different AI algorithms, enhancing the interpretability of the results. Future research is recommended to conduct detailed analyses of the SHAP algorithm with different AI algorithm models and to thoroughly evaluate its impact on areas such as building energy efficiency, occupant comfort, and cost. İn addition, this algorithm can be used in real-time building management systems in conjunction with machine learning methods, and the performance of this integrated system can be tested and compared in different climate zones.

Author Contribution Declaration

A.	*Idea and editing*	***B.***	*Literature Review*	***C.***	*Writing*
D.	*Data Collection*	***E.***	*Analysis*	***F.***	*Critical Review*

Resul ÖZLÜK: **A/ B/ C/ D/ E/ F**

Yusuf YILDIZ: ***A/ B/ F***

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