

## *Retraction*

# **Retracted: A Risk Assessment Algorithm for College Student Entrepreneurship Based on Big Data Analysis**

### **Complexity**

Received 15 August 2023; Accepted 15 August 2023; Published 16 August 2023

Copyright © 2023 Complexity. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

### **References**

- [1] C. Zhou and D. Wang, "A Risk Assessment Algorithm for College Student Entrepreneurship Based on Big Data Analysis," *Complexity*, vol. 2021, Article ID 6359296, 12 pages, 2021.

## Research Article

# A Risk Assessment Algorithm for College Student Entrepreneurship Based on Big Data Analysis

Chengjun Zhou <sup>1</sup> and DuanXu Wang<sup>2</sup>

<sup>1</sup>Vocational and Technical College, Lishui University, Lishui 323000, China

<sup>2</sup>School of Management, Zhejiang University, Hangzhou, Zhejiang 310000, China

Correspondence should be addressed to Chengjun Zhou; [lsxyzcj@lsu.edu.cn](mailto:lsxyzcj@lsu.edu.cn)

Received 7 April 2021; Revised 27 April 2021; Accepted 10 May 2021; Published 20 May 2021

Academic Editor: Zhihan Lv

Copyright © 2021 Chengjun Zhou and DuanXu Wang. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

College student entrepreneurship is a complex and dynamic process, in which the potential risks faced by entrepreneurial enterprises are interactive and diverse. The changes in risk assessment for college student entrepreneurship are also dynamic and nonlinear and are affected by many factors, which make the risk assessment process for college student entrepreneurship quite complicated. Big data analysis technology is a new product formed under the background of cloud computing and Internet technology, which has the characteristics of large data scale, multiple data types, and strong data value and provides more technical support for the researches on the risk assessment algorithm for college student entrepreneurship. On the basis of summarizing and analyzing previous research results, this article expounded the research status and significance of the risk assessment algorithm for college student entrepreneurship, elaborated the development background, current status, and future challenges of big data analysis technology, introduced the basic principles of support vector machine (SVM) and hierarchical analytic process, constructed a risk assessment model for college student entrepreneurship based on big data analysis, analyzed the risk factors and assessment indicators of the entrepreneurial model, proposed a risk assessment algorithm for college student entrepreneurship based on big data analysis, performed the discrimination coefficient calculation and comprehensive correlation optimization, and finally conducted a case experiment and its result analysis. The study results show that the risk assessment algorithm for college student entrepreneurship based on big data analysis can effectively realize the comprehensive management of risk factors, make full use of the value of assessment parameter data, and significantly improve the accuracy and efficiency of the risk assessment for college student entrepreneurship, providing more technical support for the researches on the risk assessment algorithm for college student entrepreneurship. The study results of this article provide a reference for further researches on the risk assessment algorithm of college student entrepreneurship based on big data analysis.

## 1. Introduction

College student entrepreneurship is a complex and dynamic process, in which the risks faced by entrepreneurial enterprises are complex and diverse and there are also interactions between these risks. For example, many college student entrepreneurs only have entrepreneurial enthusiasm alone, but the initial division of labor is not clear enough, the comprehensiveness of the team is not strong enough, or the comprehensive ability of the individual also is not enough [1]. The changes in risk assessment for college student entrepreneurship are dynamic and nonlinear and are affected by

many factors, such as national policies, college students' own quality, and investment funding, making the process of risk assessment for college student entrepreneurship quite complicated [2]. Entrepreneurship runs through the life cycle of an enterprise and plays an important role in all aspects of the enterprise's emergence, development, maturity, and decline. College student entrepreneurship has many shortcomings, such as lack of experience, lack of interpersonal relationships and business networks, inaccurate grasp of the market, lack of market awareness and business management experience, insufficient funds, and a series of other problems [3]. Risk assessment for college student entrepreneurship can estimate

future risks, which is helpful to take effective preventive measures based on the estimated results. Therefore, how to improve the accuracy and objectivity of risk assessment for college student entrepreneurship is a problem that needs to be solved urgently [4].

In recent years, with the constant maturity of big data analysis technology, some approaches such as support vector machines (SVM) and analytic hierarchy have emerged, providing more technical support for the researches on the risk assessment algorithm for college student entrepreneurship [5]. From the perspective of big data, it mainly refers to a new product formed under the background of cloud computing and Internet technology, which has the characteristics of large data scale, multiple data types, and strong data value. Under normal circumstances, big data analysis technology is involved in many fields [6]. Mutual trust among team members can stimulate the entrepreneurial enthusiasm of the entrepreneurial team, and the degree of trust determines the operational efficiency of the entrepreneurial team. The arrival of the big data era provides college students with such data leasing, data analysis, decision-making outsourcing, data trading, and other entrepreneurial directions. In the era of big data, the huge amount of information has a significant impact on the decision-making and development of every enterprise and no enterprise can stay out of the matter [7]. Big data can promote college students' understanding of future demand development trends, and it is the opportunity for college students to choose the direction of entrepreneurship, which enhances the correctness and guarantee of entrepreneurial path selection [8].

On the basis of summarizing and analyzing previous research results, this paper expounds the research status and significance of the risk assessment algorithm for college student entrepreneurship, elaborates the development background, current status, and future challenges of big data analysis technology, introduces the basic principles of SVM and hierarchical analytic process, constructs a risk assessment model for college student entrepreneurship based on big data analysis, analyzes the risk factors and assessment indicators of the entrepreneurial model, proposes a risk assessment algorithm for college student entrepreneurship based on big data analysis, performs the discrimination coefficient calculation and comprehensive correlation optimization, and finally conducts a case experiment and its result analysis. The study results of this article provide a reference for further researches on the risk assessment algorithm of college student entrepreneurship based on big data analysis. The detailed chapters are arranged as follows: Section 2 introduces the basic principles of SVM and hierarchical analytic process; Section 3 constructs a risk assessment model for college student entrepreneurship based on big data analysis; Section 4 proposes a big data analysis-based entrepreneurial risk assessment algorithm for college students; Section 5 is the example experiment and the result analysis; Section 6 is the conclusion.

## 2. Methods and Principles

**2.1. Support Vector Machine.** Suppose  $X$  is the college student entrepreneurship event to be evaluated;  $\{x_1, x_2, \dots, x_n\}$  is the  $n$  indicators of the assessment system;  $y_i$  is the value of each indicator;  $z_i$  is the core competitiveness of college student entrepreneurship; the success rate of college student entrepreneurship is established, and the assessment index system can be organized as follows:

$$X_i = a \prod_{i=1}^n x_i + b \prod_{i=1}^n \frac{y_i}{z_i}, \quad (1)$$

where  $a$  represents the type of assessment index for the success rate of college student entrepreneurship;  $b$  is the level of core competitiveness of college student entrepreneurship. If  $a$  represents the gray assessment weight vector, the gray assessment coefficient of the success rate of college student entrepreneurship can be calculated as follows:

$$Q_i = \frac{c(X_i - X_{i-1})}{(d - e)(X_i + X_{i-1})}, \quad (2)$$

where  $c$  is the gray assessment weight of the gray category;  $d$  is any secondary index;  $e$  is the gray assessment weight vector set for evaluating the gray category.

Suppose the data for the risk assessment algorithm for college student entrepreneurship is  $\{q_i, w_i\}$ ;  $q_i$  is the input of college students' entrepreneurial risk;  $w_i$  is the risk level of college student entrepreneurship; then, the optimal classification plane can be described in the following way:

$$W_i = e \sqrt{\sum_{i=1}^n \frac{q_i}{w_i}}. \quad (3)$$

In the formula,  $e$  is the weight of the optimal classification plane. The assessment function is a calculation method that determines how to perform the assessment according to the requirements of ranking and selecting the best. Generally speaking, the importance of each factor is different. In order to reflect the importance of each factor, each factor  $R$  should be assigned a corresponding weight value  $r_i$ , the set of weight values:

$$R_i = t \cdot r_{i-1} + u \cdot r_i + o \cdot r_{i+1}, \quad (4)$$

where  $t$  is the risk assessment function of college student entrepreneurship;  $u$  is the order of the risk assessment for college student entrepreneurship matrix;  $o$  is the average random consistency index.

For college students who want to embark on the road of entrepreneurship, they have to face more difficulties in the process of entrepreneurship due to the lack of social experience, social relations, capital, technology, etc. Based on the principle of SVMs, the objective function of the algorithm is as follows:

$$T_{ij} = \frac{1}{n+m} \sqrt{\sum_{i=1}^n \sum_{j=1}^m \left( \frac{s_{ij} - f_{ij}}{p_{ij} - a_{ij}} \right)}, \quad (5)$$

where  $p_{ij}$  is the number of cluster centers classified by the subordinate center  $i$  of the data  $i$ ;  $a_{ij}$  is the degree of membership of the subordinate center  $i$  of the data  $j$ ;  $s_{ij}$  is the distance between the data  $i$  and the cluster center  $i$ ;  $f_{ij}$  is the weighted value of the subordinate center  $i$  of the data  $j$ ;  $n$  is the number of data to be processed;  $m$  is the weighted index.

**2.2. Hierarchical Analysis.** In the risk assessment process, the fuzzy network constantly revises the posterior probability based on the prior probability of the event and the new data obtained through the questionnaire survey, avoiding the lack of data caused by only using historical data, loss of rigor, and timeliness and making the assessment results truly objective. If the prior probability is  $Y(x_i)$  and the new information obtained after statistical processing of the questionnaire is  $U(x_i)$ , then the posterior probability is as follows:

$$U(x_i) = \frac{Y(x_i)}{T_{ij}}. \quad (6)$$

Suppose the assessment object set composed of  $n$  subsystems in the risk system is  $I_n = \{i_1, i_2, \dots, i_n\}$ ; the index set corresponding to each subsystem is  $O_n = \{s_1, s_2, \dots, s_n\}$ ; then, the subsystem using index feature vector can be expressed as follows:

$$[I_{ij}]_n \times [O_{ij}]_n = \begin{bmatrix} k_{11} & k_{12} & \cdots & k_{1n} \\ k_{21} & k_{22} & \cdots & k_{2n} \\ \vdots & \vdots & \cdots & \vdots \\ k_{n1} & k_{n2} & \cdots & k_{nn} \end{bmatrix}, \quad (7)$$

where  $k_{ij}$  is the magnitude of the  $i$ -th system assessment index of the object  $j$ . The type and quantity of services carried by each network node are also different. According to the importance of the service and the corresponding quantity, the design node importance model is the impact on the stable operation of the system:

$$A(k) = \sum_{i=1}^k \frac{g_i \cdot h_i}{g_i - h_i}, \quad (8)$$

where  $g_i$  is the  $i$ -th service type carried;  $h_i$  is the number of this service type carried;  $k$  is the weight of the service; through model analysis, the greater the importance of the node, the greater the asset value of the node or the greater the impact on the stable operation of the system, and the higher the risk.

Based on the fuzzy probability, the accurate probability  $S_i$  of the node is calculated by the mean area method, and finally the conditional probability  $D_i$  of the node is obtained from the normalization probability:

$$D_i = \frac{e^i - e^{\epsilon_i}}{v_i + b_j}. \quad (9)$$

In the formula,  $l_i$  is the discrimination coefficient;  $e_i$  is the weight;  $v_i$  is the weight of the optimal classification plane;  $b_i$  is the relaxation factor. Relying on the dependence on big data can attract more companies to participate in this industry. At the same time, it can also use methods such as data analysis and storage to improve transparency, so as to achieve the goal of humanized service and obtain objective benefits.

The system has two levels of index factors and the risk assessment model for college student entrepreneurship based on big data analysis is to analyze the risk factors and assessment indicators of the entrepreneurial model. Therefore, the vulnerability assessment model of network nodes is designed as follows:

$$G_{ij} = \prod_{i,j} \ln \frac{\alpha \cdot q_{ij}}{e_{ij} - r_{ij}}, \quad (10)$$

where  $\alpha$  is the degree of error penalty;  $n$  is the order of the system;  $q_{ij}$  is the assessment index value of the  $j$ -th second-level index factor under the  $i$ -th first-level index factor, which is obtained by scoring the assessment index;  $e_{ij}$  is the  $i$ -th weight of the  $j$ -th second-level index factor under the first-level index factor;  $r_i$  is the weight of the  $i$ -th first-level index factor, and the weight is given by experts based on experience.

### 3. Risk Assessment Model for College Student Entrepreneurship Based on Big Data Analysis

**3.1. Risk Factors.** The era of big data has given colleges and universities new connotations of entrepreneurship education, aiming to help college students improve their employment and entrepreneurship quality and social abilities. It is not only the professional knowledge needed for entrepreneurship but also the ability to learn social communication and obtain effective information in a timely manner. In the future, the algorithm will better adapt to the employment and entrepreneurship environment in the era of big data. In the teaching process, guidance should be directed to the common problems faced by entrepreneurship in the future in the era of big data to provide direction for students who aspire to entrepreneurship. Whether the data are sensitive or not is related to the future development of the company and the lack of data sensitivity of college students will cause them to lose many good opportunities in the process of starting a business. Entrepreneurs need not only technology but also ideas and business capabilities. Nowadays, many entrepreneurs only have technology or business ability alone [9]. If the employment situation of college students is analyzed based on these data, it will cause errors in the analysis results and provide poor guidance to the employability of college students. Business models are

often selected based on an in-depth understanding of their own resources and the external environment. Feasibility and timeliness will directly affect the design of business models. Entrepreneurship mentors can intersperse some details into the online explanation process and discover some problems that are difficult to find in ordinary times in the online class. Figure 1 shows the risk assessment framework for college student entrepreneurship based on big data analysis.

In the era of big data, the huge amount of information has a significant impact on the decision-making and development of every company and no company can stay out of the matter. This requires participants in company affairs to master certain data processing and screening skills, and the company's technology team must have proficient data processing capabilities. Especially for college students who want to embark on the road of entrepreneurship, due to insufficient social experience, social relations, funds, technology, etc., they have to face more difficulties in the entrepreneurial process. Therefore, superior data processing capabilities are increasingly indispensable. Teachers should pay attention to methods when disseminating knowledge related to the data age to students. It is best to adopt a method that meets the students' cognitive level, knowledge level, hobbies, and comprehension abilities to attract college students' interest in the era of big data and make students at the university level. They began to fully understand the relevant knowledge and skills of data processing to lay a solid foundation for society. To sum up, in the era of big data, every enterprise is faced with the opportunities and challenges brought about by massive amounts of information. If it makes good use of it, it can promote the long-term development of the enterprise.

Through the construction of massive data models, it is conducive to mining the changing laws of things, accurately predicting the development trend of things, and conducting timely and effective interventions. Big data has very broad application prospects in almost all fields, which can be seen that big data is in model construction and have dynamic characteristics. A small number of data only refers to the data formed in a certain stage and these data have certain instability. The initial division of labor of many entrepreneurial teams is not clear enough, the comprehensiveness of the team is not strong enough, or the comprehensive ability of the individual is not enough. The social environment faced by the algorithm is more complex, and of course, the algorithm must learn negotiation skills, make contacts, and increase product highlights when operating projects. By rationally designing business models and choosing diversified business models, it can guide the smooth development of college students' employment. In this process, it is necessary to divide the regional centers scientifically, not necessarily based on the existing administrative regions. They can be divided according to the employment network of college students and economic development so as to ensure that the collected data analysis results will not be affected and give full play to the role of big data analysis technology [10].

*3.2. Assessment Indicators.* The scope of big data information is very broad and it can obtain information on all aspects of people's lives, grasp the trend of future development of demand, and provide many emerging industries. Big data can promote college students' understanding of future demand development trends, and it is the opportunity for college students to choose the direction of entrepreneurship, which enhances the correctness and guarantee of entrepreneurial path selection. In addition, as the most advanced technology at present, big data is still in its infancy. The great power of big data has not yet been developed, and college students have the most opportunity to get in touch with this kind of cutting-edge technology and usher in their own broad entrepreneurship. The development and research of space, big data, and related fields is a good entrepreneurial direction for college students (Figure 2). When colleges and universities conduct entrepreneurship training for students, they should pay attention to the cultivation of students' awareness of using big data and analyze the various advantages that big data brings in entrepreneurship and at the same time how to avoid risks and find the right time. Through the cultivation of students' awareness of using big data, students will be more open in thinking, which is conducive to the formation of a unique perspective of students' entrepreneurship. Only when students are made aware of the importance of information resources can students develop the ability to capture and analyze information. This is also a talent that enterprises urgently need to stimulate students' innovative ability.

College student entrepreneurship is a complex and dynamic process. In the course of entrepreneurship, the risks faced by startups are complex and diverse and there are interactions between risks. For example, the core team's technological backwardness leads to entrepreneurial failure, but the core team's technological backwardness may be due to insufficient entrepreneurial funds. Similarly, the intuitive reason for the failure of a college student to start a business is the lack of entrepreneurial experience and insufficient preparation for entrepreneurship, but there is a lack of entrepreneurial education behind this. From this, the algorithm can see the complexity of each link in the entrepreneurial process. According to the theory of resource dependence, college student entrepreneurship can be regarded as an initial organization. The external environment can ensure that the enterprise obtains the entrepreneurial resources it needs when its own resources are insufficient, and it emphasizes that the organization takes the initiative to adapt to the environment [11]. The demand-supply theory aims at the resource demand of college student entrepreneurship and external environmental resources and suggests that the conditions for college student entrepreneurship can be improved by changing the external environment and the success rate of college student entrepreneurship can be improved. The development of entrepreneurship education requires clear educational goals, including overall goals, common goals, and personalized goals. Mutual trust among team members can stimulate the

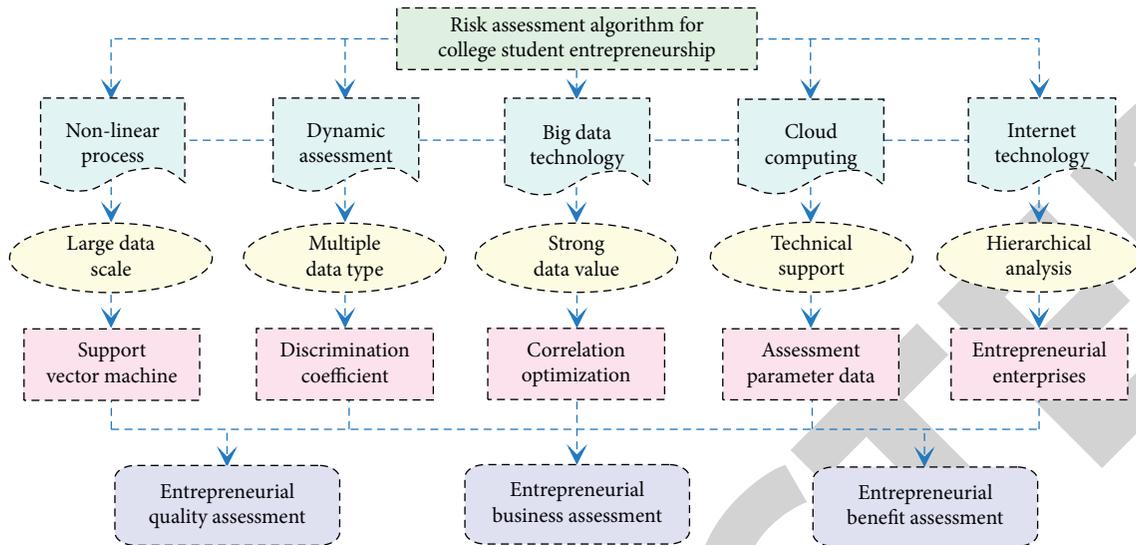


FIGURE 1: Risk assessment framework for college student entrepreneurship based on big data analysis.

entrepreneurial enthusiasm of the entrepreneurial team, and the degree of trust determines the operational efficiency of the entrepreneurial team.

With the development of science and technology, the asymmetry of information has gradually weakened. In the era of big data, traditional authority is no longer an absolute authority. Years of qualifications do not necessarily have an absolute say, and social status is no longer an absolute advantage and experience is not necessarily completely correct. Therefore, big data makes the decision-making between people at the same time tend to be rational and equal, thereby lowering the threshold for college students to start a business [12]. Many problems in the entrepreneurial process are caused by conservative thinking. College students have mature and degraded learning functions, and sufficient resources are available for use; as the main body of innovation, they have a broad vision, accept new things, and love to explore and research, etc. Because traditional relational databases cannot quickly capture and identify effective information in big data, advanced big data analysis and processing algorithms and tools are still in the learning and development stage and are not used on a large scale. Therefore, the arrival of the big data era provides college students with such data leasing, data analysis, decision-making outsourcing, data trading, and other entrepreneurial directions. Such markets require higher levels of education and learning and development capabilities and the characteristics of college students can fit this well. At the same time, it is mature and is the necessary direction for future development and provides more entrepreneurial directions for college students.

#### 4. Risk Assessment Algorithm for College Student Entrepreneurship Based on Big Data Analysis

**4.1. Discrimination Coefficient Calculation.** Compared with other groups, the group of college students has certain particularities in the entrepreneurial process. College students have obvious advantages in terms of academic level,

energy and physical fitness, and development potential, but they lack competitiveness in terms of work experience, labor skills, social capital, and wealth accumulation. The degree of matching between supply and demand depends on educational background, market structure, and institutional factors and is also affected by the level of effort of college students in suitable positions. The employment of college students is developing from large- and medium-sized cities to county-level cities, and employment units are concentrated in small- and medium-sized nonindustrial enterprises. Fully grasping the standardized management methods, technical policies, and professional guidance in the innovation and entrepreneurship environment provided by major universities is critical to establish a good business image for entrepreneurs. This will not only absorb more industrial resources but also inspire more college students to start their own businesses. Universities, companies, and the government constitute the triple helix relationship between college student entrepreneurship. In recent years, the public opinion and institutional environment supporting college student entrepreneurship have been gradually optimized. The effect of continuous enhancement in universities has extensively carried out entrepreneurship education to cultivate students' entrepreneurial abilities and entrepreneurship education. However, what cannot be ignored is the fact that the low success rate of college students in entrepreneurship is obvious to all. How to synchronize entrepreneurship education with solving practical problems still needs to be explored [13]. The flowchart of the risk assessment algorithm for college student entrepreneurship based on big data analysis is shown in Figure 3.

In the era of rapid development of information networks, in order to enable college students to have a deeper understanding of innovation and entrepreneurship, it is undoubtedly an indispensable measure to carry out entrepreneurship education for them. Among them, most college students who have studied entrepreneurship education are replaced with entrepreneurs who have studied management

knowledge. More research data show that entrepreneurship majors and college students who have received entrepreneurship-related education are among the number of successful entrepreneurs. It accounts for a heavier proportion because entrepreneurship education not only gives college students important knowledge of entrepreneurship and allows them to accumulate experience in practice so that they can develop in an all-round way on the road of entrepreneurship. First of all, in the context of big data, college students grasp the opportunity to use the Internet to establish a complete set of entrepreneurial plans. This undoubtedly poses a new challenge for the construction of the innovation and entrepreneurship environment for college students. It makes college students more inclined to choose innovation and entrepreneurship, but they are still college students. The employment intentions and professional values of college students continue to lean towards white-collar positions and big data is the current background for college student entrepreneurship. When college students' career choice intentions and social needs become apparently asymmetries, their willingness to start a business increases.

The core of big data is prediction, but the purpose of data has nothing to do with the data itself but with the interpreter of the data. In the context of big data, the focus of the cultivation of innovative talents is to find relevant connections from data, capture value, and foresee the future. Entrepreneurship education is developed when the social economy develops to a specific period, which is biased towards changing market needs and has a strong practicality and requires high professional skills and comprehensive quality of teachers. Educational innovation in the era of big data requires timely and reliable support of massive data. Colleges and universities should attach importance to the creation and use of big data platforms and use big data analysis techniques to help managers better improve education. The development trend of big data is not only a positive promotion for college student entrepreneurs but also a great benefit for college entrepreneurial instructors [14]. The era of big data provides a new direction for college student entrepreneurs. In the context of the big data era, big data-related technologies have been developed, and new entrepreneurial directions related to them have also emerged, bringing new market segments, such as pipeline layout, network configuration, data transmission surface, and other hardware aspects, including data languages, databases and data services, and other software. These emerging data technologies all have a huge entrepreneurial market, which can bring new development opportunities to college student entrepreneurs.

*4.2. Comprehensive Relevance Optimization.* In the process of cultivating college students' innovation and entrepreneurship capabilities, training goals, teaching interaction, or the environment inside and outside the classroom, all belonging to external factors, and their role must rely on students' active learning. College students use the Internet to carry out innovation and entrepreneurship has become a very popular way of entrepreneurship nowadays. This kind

of entrepreneurial method has the advantages of simple operation, low initial capital investment, not restricted by time and place, and low risk. Entrepreneurship through the Internet can enrich the entrepreneurial experience of college students, so it is also a way of entrepreneurship that many college students choose more. To this end, colleges and universities should pay attention to cultivating college students' innovative and entrepreneurial thinking, encourage college students to establish confidence in innovation and entrepreneurship, and learn and master different types of entrepreneurial methods through various channels (Figure 4). By cultivating innovative and entrepreneurial thinking, college students enhance their acumen in observing the market and industry and make them good at discovering some business opportunities and entrepreneurial points. College students have a strong sense of autonomy, strong independence, pursuit of individualization, and the courage to compete. With the advent of the era of big data, information transmission is getting faster and faster, integrity returns to the origin of business, business is no longer so mysterious, and competition has become fairer.

A suitable business model is an important choice for college students who start their own businesses and college student entrepreneurs need to have clear control of their own situation, and at the same time, they need to conduct a detailed analysis of the external environment before they can get a suitable choice. In the era of big data, the integration and analysis of information allow entrepreneurs to have more choices to choose a suitable and feasible business model. For college students in the early stage of entrepreneurship, it is a key choice for entrepreneurial success and big data has brought many new changes to the current college students' self-employment. These changes challenge the students' entrepreneurial ability and provide equal opportunities for every college student. In the era of big data, college students can obtain big data through the continuous development of cutting-edge Internet technologies and use these big data to obtain effective information that they can use, helping college students to be rational and effective in their own entrepreneurial environment and current industry conditions. As far as the current self-employment environment is concerned, the self-employments of college students cannot be just a static observation of the external environment. This requires effective use of big data and deep processing of massive amounts of data to solve the current status of the selected industry, the problems faced, and the solution methods and other effective analysis so as to make the correct decision [15].

In the process of starting a business, a big problem faced by college student entrepreneurs is that many college students lack social practical experience and have a low level of knowledge and understanding of the entrepreneurs they choose. If the college student entrepreneurs do not receive timely guidance from professionals in the industry, it is very likely to suffer setbacks during the startup period, and even the entire entrepreneurial project will die due to this. Before stepping into the new media era, it was more difficult for college students to obtain entrepreneurial information, and there were limited ways to obtain entrepreneurial guidance.

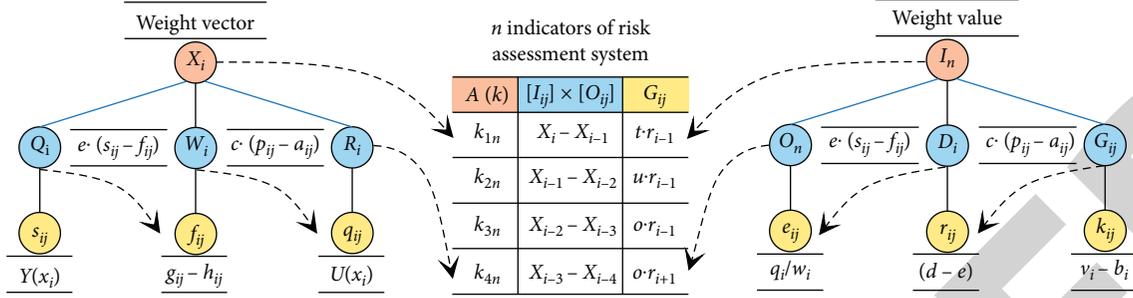


FIGURE 2: Assessment indicators for college student entrepreneurship based on big data analysis.

However, after entering the new media era, this situation has changed drastically. The ways for college students to obtain entrepreneurial information and obtain entrepreneurial guidance have greatly increased. By relying on new media, colleges and universities can concentrate a large amount of entrepreneurial information on the Internet in a short time and then use the Internet to quickly integrate and disseminate this entrepreneurial information so as to meet the needs of college students for entrepreneurial information [16]. Vigorously developing the Internet platform economy is of great significance for expanding the modern service industry, promoting the continuous innovation of traditional industries and economic transformation and upgrading, accelerating the construction of a modern industrial system, and promoting economic development to a new level. When college students choose employment and entrepreneurship opportunities, they can take advantage of the development of the Internet platform, integrate into the development trend of large platforms, large markets, and large circulation, and create an innovative and independent Internet platform.

## 5. Case Analysis

**5.1. Case Description.** For the risk assessment algorithm of college student entrepreneurship, an event can be in two situations: one that can become an entrepreneurial opportunity and the other cannot. It is assumed that the total number of entrepreneurial-related events in a region per unit time is  $a_i$ , among which the number of events that can become entrepreneurial opportunities is  $b_i$ , and the number of events that cannot is called  $r_i$  as the probability of an entrepreneurial opportunity. Generally speaking, for a given place, it is a function of time and place and it is a function of time and now determines the equation it satisfies. It is supposed that the number of newly added entrepreneurial opportunities per unit time and the probability of an event's appearance is  $r_i$ ; then, the probability of increased entrepreneurial opportunities per unit time is  $r_{i+1}$ ; on the other hand, events that have become entrepreneurial opportunities due to the entrepreneur's personal ability, psychological factors, and competition may lose entrepreneurial opportunities. It is also supposed that the number of lost entrepreneurial opportunities per unit time is  $d_i$ , and then, the probability of reducing entrepreneurial opportunities per unit time is  $k_i$ , so the net increase probability of

entrepreneurial opportunities per unit time is the difference between  $r_i$  and  $k_i$ . In addition to external factors, the entrepreneurial opportunity generation rate is related to the entrepreneur's personal professional knowledge, judgment of things, and decision-making power (Figure 5).

To find the point where the product and the market fit together, the algorithm must first find a market, which means that people, money, or companies form a certain collection. The ways for college students to obtain entrepreneurial information and obtain entrepreneurial guidance have greatly increased. With the advent of the era of big data, information transmission is getting faster and faster, integrity returns to the origin of business, business is no longer so mysterious, and competition has become fairer. The products in this collection have strong customer appeal no matter what; the proportion in the market is an important sign to judge whether the market is strong or not, and the products that need to be developed must meet certain needs of people. The need depends on the product and the target market and more precise customer positioning in the market is also an indispensable marketing strategy [17]. More research data show that entrepreneurship majors and college students who have received entrepreneurship-related education are among the number of successful entrepreneurs. The employment of college students is developing from large- and medium-sized cities to county-level cities, and employment units are concentrated in small and nonindustrial enterprises. The interpersonal relationship and the existing inherent abilities of college students complement each other because the traditional education system is involved and students' innovative ideas have been suppressed for a long time.

**5.2. Result Analysis.** In the context of big data, traditional authority, social hierarchy, and age qualifications no longer have the right to control and make decisions, which lowers the threshold for college student entrepreneurship and employment. Business under big data is more transparent and information is more symmetrical. As college students who have received higher education, they have more advantages in entrepreneurship and employment. Coupled with the influence of changes in social structure, the employment and entrepreneurship model and business model of college students have also undergone major changes (Figure 6). Therefore, in practice, the algorithm must start

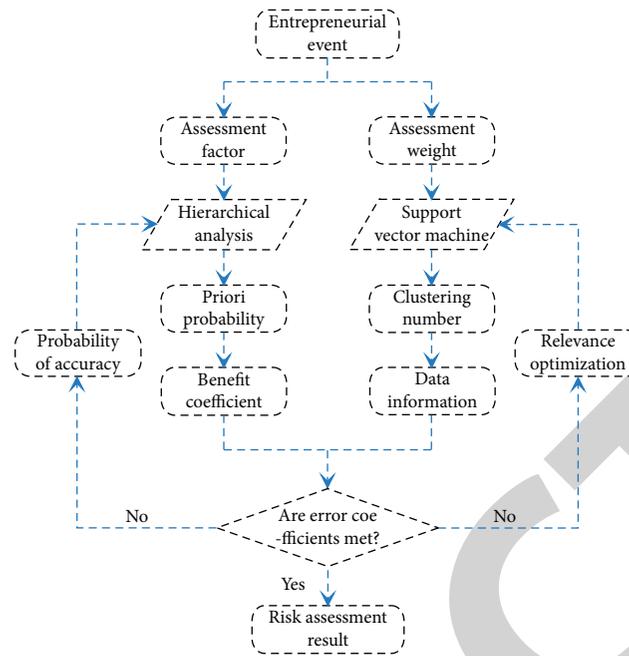


FIGURE 3: Flowchart of risk assessment algorithm for college student entrepreneurship based on big data analysis.

with the development of the poststructure, insist on analyzing from the background of big data, and at the same time adjust the rationality of space and form, and promote the development of the information industry chain on the basis of effective research and improvement. From a provider to a dominant player at this stage, the network media itself is constantly improving [18]. They pay attention to the key points of marketing in the era of big data, understand the data and information behind consumers, and do a good job of digging into user needs so as to achieve personalized services and ensure the rationality of construction plans and strategies. At the same time, data analysis and storage can be used to increase transparency so as to achieve the goal of humanized service and obtain objective benefits.

In the current era of rapid social and economic development, the development of science and technology is closely related to the transformation of the industry and can accelerate the progress of the optimization of the industrial structure and the process of entrepreneurship. At the same time, a college student will also become important in new technology fields such as new energy and information. The new direction of innovation and entrepreneurship has promoted rapid economic growth and college student entrepreneurship incubation projects are unique [19]. To a certain extent, this not only optimizes the entrepreneurial structure of college students but also points out the direction of innovation and entrepreneurship for college students. This makes the innovation and entrepreneurship structure of college students fit the development of industrial structure optimization and can better achieve the goals of innovation and entrepreneurship (Figure 7). The uniqueness of a project refers to the inherent characteristics of a project that is different from other projects and this characteristic is said to be absent from other projects and is different from other projects. Any college student entrepreneurship incubation

project has a specific project time and place, specific project participants, specific task goals, specific organization members, specific resources and constraints, etc. Just as there are no two identical leaves in the world, due to factors such as environment, conditions, project personnel, time, goals, etc., college student entrepreneurship incubation projects are irreversible and cannot be copied [20].

In the process of entrepreneurship, the funds, space, equipment, and some necessary labor provided by college students are collectively referred to as economic capital. In the process of entrepreneurship, college students can use the advantages of environmental capital to provide the entrepreneurial process with more favorable conditions and make entrepreneurial activities more convenient through the application of capital [21–24]. For example, in the selection of entrepreneurial types, it is necessary to rely on the requirements of business development in the era of big data [25–28]. College students can use information-based thinking to build a platform for entrepreneurship. This is an effective application of data operations for college students in entrepreneurship under the modern economic background. In the new economic era, college students need to pay attention to the environmental advantages of entrepreneurial capital in the process of entrepreneurship. That is to say, college students need to pay attention to environmental factors in the influencing factors of entrepreneurial performance and realize the implementation of entrepreneurial countermeasures through the assessment of environmental advantages [29–33]. Under the circumstances, college students need to pay attention to the use of new environments and new conditions in the entrepreneurial environment. For example, in the media field, college students can pay attention to the electronic, digital, and instrumental entrepreneurial environment according to the requirements of data. Using the channels of network cultural

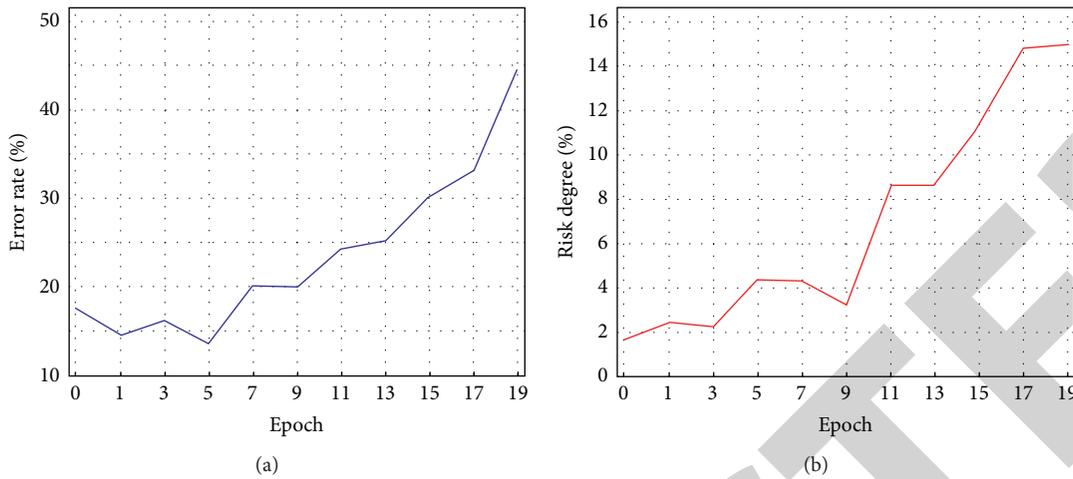


FIGURE 4: Risk assessment error rates (a) and risk degrees (b) for college student entrepreneurship based on big data analysis.

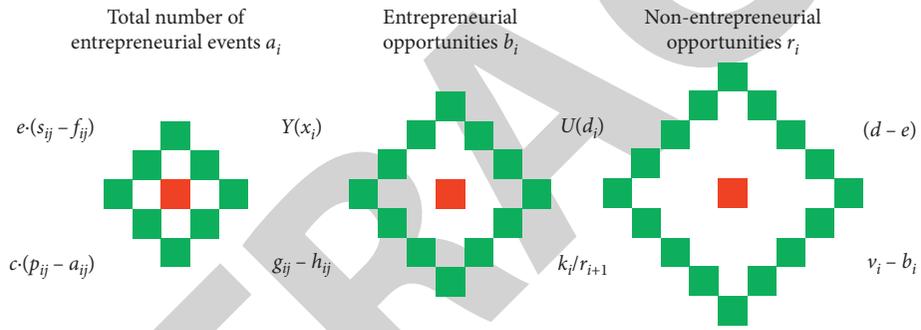


FIGURE 5: Case description in assessing the risk of college student entrepreneurship based on big data analysis.

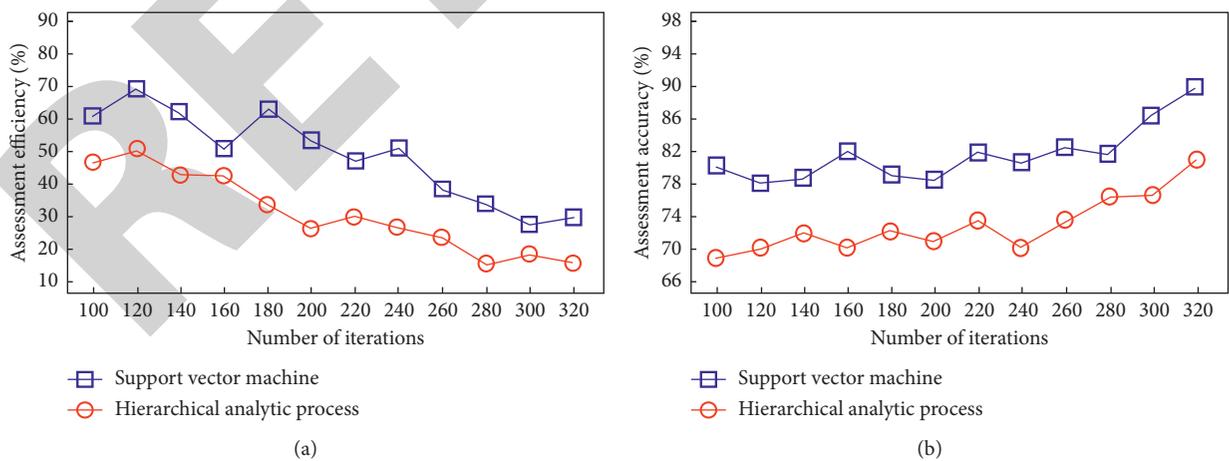


FIGURE 6: Risk assessment efficiency (a) and accuracy (b) of college student entrepreneurship.

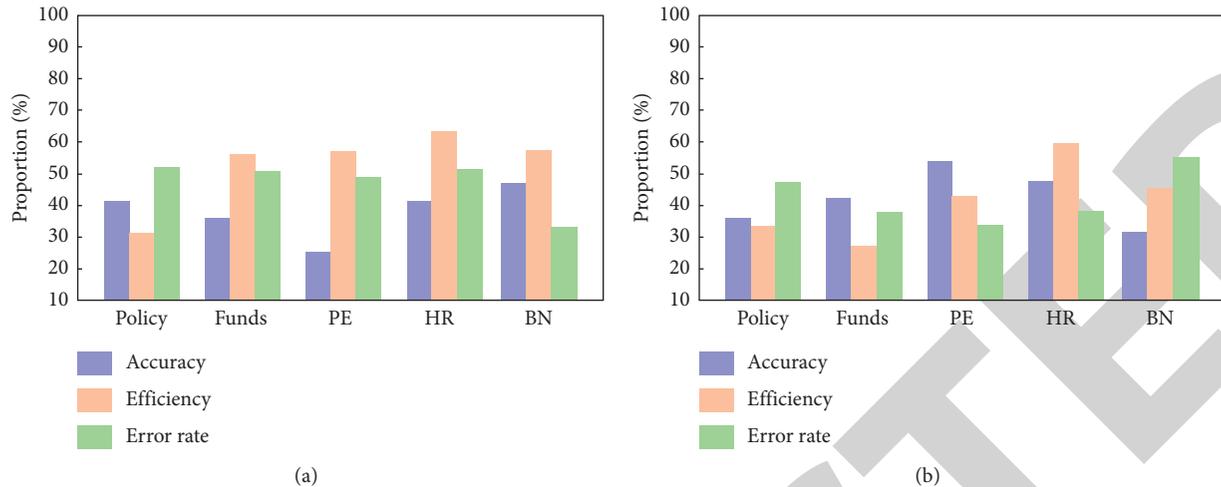


FIGURE 7: Proportions of five main risk factors in assessing college student entrepreneurship with (a) support vector machine and (b) hierarchical analysis.

communication, the modern business model can be extended to the degree of integration with products and people.

## 6. Conclusions

This article constructed a risk assessment model for college student entrepreneurship based on big data analysis, analyzed the risk factors and assessment indicators of the entrepreneurial model, proposed a risk assessment algorithm for college student entrepreneurship based on big data analysis, performed the discrimination coefficient calculation and comprehensive correlation optimization, and finally conducted a case experiment and its result analysis. The core of big data is prediction, but the purpose of data has nothing to do with the data itself but with the interpreter of the data. In the context of big data, the focus of the cultivation of innovative talents is to find relevant connections from data, capture value, and foresee the future. In the era of big data, the huge amount of information has a significant impact on the decision-making and development of every company and no company can stay out of the matter. College students have mature and degraded learning functions, and sufficient resources are available for use; as the main body of innovation, they have a broad vision, accept new things, and love to explore and research. The initial division of labor of many entrepreneurial teams is not clear enough, the comprehensiveness of the team is not strong enough, or the comprehensive ability of the individual is not enough. This makes the innovation and entrepreneurship structure of college students fit the development of industrial structure optimization and can better achieve the goals of innovation and entrepreneurship. The study results show that the risk assessment algorithm for college student entrepreneurship based on big data analysis can effectively realize the comprehensive management of risk factors, make full use of the value of assessment parameter data,

and significantly improve the accuracy and efficiency of the risk assessment for college student entrepreneurship. The study results of this article provide a reference for further researches on the risk assessment algorithm of college student entrepreneurship based on big data analysis.

## Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

## Conflicts of Interest

The authors declare that they have no conflicts of interest.

## Acknowledgments

This work was supported by Ministry of Education 2020 cooperative education project: virtual simulation conception and practice of nursing maker space (Project no. 202002103016); the first batch of teaching reform research projects in the 13th Five Year Plan of Higher Education in Zhejiang Province: accurate docking with rural revitalization: exploration and practice of training skilled talents for mountainous areas (Project no. jg20180362); social science research project of Lishui City in 2019: a study on the culture and entrepreneurial groups of rural sages in Southwest Zhejiang (Project no. lc201906); and “Teacher Professional Development Project” of Domestic Visiting Scholars in Colleges and Universities in 2020: research on the policy guarantee system of youth returning home to start a business under the background of “two mountains” concept (Project No. FX2020052).

## References

- [1] J. Prüfer and P. Prüfer, “Data science for entrepreneurship research: studying demand dynamics for entrepreneurial

- skills in The Netherlands,” *Small Business Economics*, vol. 55, no. 3, pp. 651–672, 2020.
- [2] A. Komarova, L. Tsvetkova, S. Kozlovskaya, and N. Pronkin, “Organisational educational systems and intelligence business systems in entrepreneurship education,” *Journal of Entrepreneurship Education*, vol. 22, no. 5, pp. 1–15, 2019.
- [3] M. Chen, S. Lu, and Q. Liu, “Uniform regularity for a Keller-Segel-Navier-Stokes system,” *Applied Mathematics Letters*, vol. 107, p. 106476, 2020.
- [4] E. L. Glaeser, S. D. Kominers, M. Luca, and N. Naik, “Big data and big cities: the promises and limitations of improved measures of urban life,” *Economic Inquiry*, vol. 56, no. 1, pp. 114–137, 2018.
- [5] S. Hartong, “Between assessments, digital technologies and big data: the growing influence of “hidden” data mediators in education,” *European Educational Research Journal*, vol. 15, no. 5, pp. 523–536, 2016.
- [6] P. P. Maglio and C.-H. Lim, “Innovation and big data in smart service systems,” *Journal of Innovation Management*, vol. 4, no. 1, pp. 11–21, 2016.
- [7] M. M. Ayalew, “Bayesian hierarchical analyses for entrepreneurial intention of students,” *Journal of Big Data*, vol. 7, no. 1, pp. 1–23, 2020.
- [8] J. I. Gimenez-Nadal, M. Lafuente, J. A. Molina, and J. Velilla, “Resampling and bootstrap algorithms to assess the relevance of variables: applications to cross section entrepreneurship data,” *Empirical Economics*, vol. 56, no. 1, pp. 233–267, 2019.
- [9] T. Roman and A. Maxim, “National culture and higher education as pre-determining factors of student entrepreneurship,” *Studies in Higher Education*, vol. 42, no. 6, pp. 993–1014, 2017.
- [10] S. Bacq and E. Alt, “Feeling capable and valued: a prosocial perspective on the link between empathy and social entrepreneurial intentions,” *Journal of Business Venturing*, vol. 33, no. 3, pp. 333–350, 2018.
- [11] W. T. Al-Ani, A. S. Al Musawi, and M. E. T. Osman, “Development of a scale for measuring university students’ attitudes toward entrepreneurship in Oman,” *International Journal of Humanities and Social Science*, vol. 7, no. 1, pp. 1–11, 2020.
- [12] M. RezaeiZadeh, M. Hogan, J. O’Reilly, J. Cunningham, and E. Murphy, “Core entrepreneurial competencies and their interdependencies: insights from a study of Irish and Iranian entrepreneurs, university students and academics,” *International Entrepreneurship and Management Journal*, vol. 13, no. 1, pp. 35–73, 2017.
- [13] K. M. Y. Law and K. Breznik, “Impacts of innovativeness and attitude on entrepreneurial intention: among engineering and non-engineering students,” *International Journal of Technology and Design Education*, vol. 27, no. 4, pp. 683–700, 2017.
- [14] C. Bazan, A. Datta, H. Gaultois, A. Shaikh, K. Gillespie, and J. Jones, “Effect of the university in the entrepreneurial intention of female students,” *International Journal of Entrepreneurial Knowledge*, vol. 7, no. 2, pp. 73–97, 2019.
- [15] Z. E. Horvath, “Assessing calling as a predictor of entrepreneurial interest,” *Society and Economy*, vol. 38, no. 4, pp. 513–535, 2016.
- [16] D. Damian, A. Capatina, M. Rapa, and G. Chiru, “Practice enterprises—key enablers for the development of students’ entrepreneurial skills: an FSQCA approach,” *Revista de Management Comparat International*, vol. 19, no. 5, pp. 476–486, 2018.
- [17] C. S. Hayter, A. J. Nelson, S. Zayed, and A. C. O’Connor, “Conceptualizing academic entrepreneurship ecosystems: a review, analysis and extension of the literature,” *The Journal of Technology Transfer*, vol. 43, no. 4, pp. 1039–1082, 2018.
- [18] N. Rijati, D. Purwitasari, D. Purwitasari, S. Sumpeno, and M. Purnomo, “A decision making and clustering method integration based on the theory of planned behavior for student entrepreneurial potential mapping in Indonesia,” *International Journal of Intelligent Engineering and Systems*, vol. 13, no. 4, pp. 129–144, 2020.
- [19] M. Loi, M. Castriotta, and M. C. Di Guardo, “The theoretical foundations of entrepreneurship education: how co-citations are shaping the field,” *International Small Business Journal: Researching Entrepreneurship*, vol. 34, no. 7, pp. 948–971, 2016.
- [20] T. Liu, K. Walley, G. Pugh, and P. Adkins, “Entrepreneurship education in China: evidence from a preliminary scoping study of enterprising tendency in Chinese university students,” *Journal of Entrepreneurship in Emerging Economies*, vol. 12, no. 2, pp. 305–326, 2018.
- [21] S. H. Chang, C. L. Wang, J. C. Lee, and L. C. Yu, “Who needs entrepreneurial role models? Driving forces of students’ cyber-entrepreneurial career intention,” *EURASIA Journal of Mathematics, Science and Technology Education*, vol. 14, no. 7, pp. 3083–3098, 2018.
- [22] S. P. Sassmannshausen and C. Volkman, “The scientometrics of social entrepreneurship and its establishment as an academic field,” *Journal of Small Business Management*, vol. 56, no. 2, pp. 251–273, 2018.
- [23] Y. Chen, W. Zheng, W. Li, and Y. Huang, “Large group activity security risk assessment and risk early warning based on random forest algorithm,” *Pattern Recognition Letters*, vol. 144, pp. 1–5, 2021.
- [24] K. Sim, J. Yang, W. Lu, and X. Gao, “MaD-DLS: mean and deviation of deep and local similarity for image quality assessment,” *IEEE Transactions on Multimedia*, p. 1, 2020.
- [25] J. Yang, C. Wang, B. Jiang, H. Song, and Q. Meng, “Visual perception enabled industry intelligence: state of the art, challenges and prospects,” *IEEE Transactions on Industrial Informatics*, vol. 17, no. 3, pp. 2204–2219, 2021.
- [26] J. Wang, Y. Liu, S. Niu, and H. Song, “Beamforming-constrained swarm UAS networking routing,” *IEEE Transactions on Network Science and Engineering*, p. 1, 2020.
- [27] C. Chen, C. Wang, T. Qiu, Z. Xu, and H. Song, “A robust active safety enhancement strategy with learning mechanism in vehicular networks,” *IEEE Transactions on Intelligent Transportation Systems*, vol. 21, no. 12, pp. 5160–5176, 2020.
- [28] J. Wen, J. Yang, B. Jiang, H. Song, and H. Wang, “Big data driven marine environment information forecasting: a time series prediction network,” *IEEE Transactions on Fuzzy Systems*, vol. 29, no. 1, pp. 4–18, 2021.
- [29] A. A. V. Rani and E. Baburaj, “Secure and intelligent architecture for cloud-based healthcare applications in wireless body sensor networks,” *International Journal of Biomedical Engineering and Technology*, vol. 29, no. 2, p. 186, 2019.
- [30] C. L. Stergiou, A. P. Plageras, K. E. Psannis, and B. B. Gupta, “Secure machine learning scenario from big data in cloud computing via Internet of Things Network,” *Handbook of Computer Networks and Cyber Security*, pp. 525–554, 2020.
- [31] M. Gupta and N. S. Chaudhari, “Anonymous roaming authentication protocol for wireless network with backward unlinkability, exculpability and efficient revocation check,” *Journal of Ambient Intelligence and Humanized Computing*, vol. 10, no. 11, pp. 4491–4501, 2019.
- [32] C. Hernandez, D. J. Rodriguez, and D. Giral, “Spectrum allocation model for cognitive wireless networks based on the

artificial bee colony algorithm,” *Indonesian Journal of Electrical Engineering and Computer Science*, vol. 19, no. 1, p. 257, 2020.

- [33] S. O. Ogundoyin, “A provably secure pairing-free anonymous handover authentication protocol for mobile wireless networks,” *International Journal of Mobile Communications*, vol. 18, no. 5, pp. 509–539, 2020.

RETRACTED