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Retraction

Retracted: Effect of Multimodal Teaching on Language Comprehensive Ability under the Background of Artificial Intelligence

Security and Communication Networks

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] Y. Zhang, B. Chen, and X. Zhang, "Effect of Multimodal Teaching on Language Comprehensive Ability under the Background of Artificial Intelligence," *Security and Communication Networks*, vol. 2022, Article ID 3143528, 7 pages, 2022.

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Research Article

Effect of Multimodal Teaching on Language Comprehensive Ability under the Background of Artificial Intelligence

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Reading comprehension is an important language learning skill. In English class, we should pay attention to cultivating students' reading comprehension ability to help students improve their reading comprehension ability. The application of language service products of artificial intelligence has brought great challenges and opportunities to language teaching. This research starts from the current situation of the teaching mode of English language and literature reading under the background of artificial intelligence. The following four questions are mainly studied. Can the multimodal oral teaching model improve students' oral English performance? Has the students' spoken English improved in the three aspects of language content, language accuracy, and pronunciation and intonation? Does multimodal oral teaching have a positive impact on students' attitudes towards oral learning? How can students improve their English writing? This study uses two research methods, experimental research and questionnaire survey, to explore the above research questions through a 16-week multimodal oral teaching experiment. The subjects of the experiment were 61 non-English majors in two parallel classes in the first year of a university in Xi'an. The experiment is divided into three phases: pretest of oral test, implementation of multimodal oral teaching, and posttest of oral test. The experiment proved that most students (about 67.35%) did not show much interest in reading and writing in English. Only a few students (12.24%) like to read and write. It shows that after accepting the multimodal teaching experiment, the students' oral English scores have been significantly improved, which is reflected in the language accuracy, pronunciation intonation, and language content. The students' oral English learning attitude is positive after the multimodal oral teaching.

1. Introduction

With the continuous advancement of China's reform and opening up and the deepening of foreign cultural exchanges, English has become the most widely used language for China to integrate into the world. According to data, more than 75% of international affairs are conducted in English, and almost every major international conference is inseparable from English services. Under the current international trend, it seems you need to learn English; especially good oral English skills are becoming more and more urgent and necessary. In short, English is the need of a region's development and a window to the world. Research also shows that students now start to learn English in the third grade of elementary school. However, after years of language learning, the communication between students and others is still very weak.

Human language is a one-of-a-kind form of communication that reflects human people' highly evolved spiritual powers on a biological or psychological level, as well as their social and cultural advancement. Linguistics is the study of human instinctive language capacity by analyzing and studying spoken, written, and even sign language in order to better comprehend human nature. Linguistics is a field of study that may help you grasp not only the nature of human language but also its practical applications. The ultimate essence of linguistics is to discover the internal laws of human language. In language education, numerous dictionaries, grammar books, and textbooks for language learning are developed through an understanding of the language

itself, which enhances the ability to cope with challenges and errors experienced during the language learning process.

Heavy scientific and technical computations, for example, were originally performed by the human brain. Computers can now not only perform such computations but also do it faster and more precisely than the human brain. As a result, modern people no longer consider such calculations to be "difficult tasks requiring human intelligence to execute." It can be observed that the concept of complicated work evolves with the passage of time and technological innovation, and that the precise goals of artificial intelligence science also evolve with the passage of time. On the one hand, it continues to make new progress, while on the other, it shifts its focus to more relevant and demanding objectives. In recent years, artificial intelligence language products have come out one after another and are moving forward to the commercial market.

In traditional oral English teaching, teachers' teaching concepts are relatively backward, teaching methods are unified, teaching atmosphere is low, and students' participation is generally not high. These teaching methods often result in students not being able to speak English after several semesters of oral learning, and this learning has established a scientific and correct understanding. Therefore, teachers also need to think deeply about the current educational situation: whether the current language education model and language talent training model can meet the needs of foreign language talents in the future society. Various modes of oral teaching have important theoretical significance: teachers have a deep understanding of the relevant teaching theories of various modes, which helps to update outdated teaching concepts, enhance the understanding of relevant teaching theories, and expand methods. Applying the concept of multichannel teaching to actual classroom activities can improve the teacher's theoretical teaching level, improve the teacher's ability to integrate theory into practice, and also help improve the teacher's teaching skills and understanding.

Hashem I AT is a term used in smart city environment to describe the latest communication technology and intelligence-based applications. The Internet of Things enables cities to use highly networked services to integrate sensors, radio frequency identification, and Bluetooth in real-world settings, while big data enables cities to gain valuable insights from massive volumes of data collected from many sources. However, his research technique has weaknesses, resulting in incorrect conclusions [1]. According to Xu et al., the ongoing advancement and improvement of data mining technologies poses a serious threat to human privacy and security. People have started to perform substantial study on personal data protection (PPDM), which is a new research issue in recent years. The basic idea of PPDM is to modify the data and then make the data mining algorithm execute effectively without infringing on the personal information contained in the data and to protect the security of personal privacy. But PPDM cannot achieve complete information protection [2].

This study is broken into five sections. The first section is the introduction, which focuses on the research background, as well as the theoretical and practical implications of the findings. The second section is a review of the literature, which focuses on multimedia, multimodality, interdependence between the two, and the value of multimodal oral education. The discussion of the use of multimode in oral English education, the methods of oral teaching, and the many forms of oral teaching and explanation of the theoretical basis of multimode oral English teaching are included. The third part is research design. The research process is mainly the application process of multimodal oral teaching, which is explained in detail in the teaching steps and teaching cases. The fourth part contains the results and discussion. With the help of statistical data software SPASS22.0 (Statistical Product and Service Solutions software), the oral test scores of the control group and the test class were compared and analyzed, and the existing problems were discovered and discussed [3]. Through a questionnaire survey on the attitude of the experimental class, we found the application status of multimodal oral teaching and the understanding of students' attitudes. The fifth part is the conclusion of this research. This section contains the conclusions of the teaching experiment and instructions for future oral classes. Finally, we pointed out the research flaws in this study and our expectations for future research.

2. Foreign Language Teaching Methods under the Background of Artificial Intelligence

2.1. Research on Foreign Ecological Teaching Methods. The ultimate goal of ecology teaching is to let students think with the thinking of professional ecologists and have interdisciplinary thinking, cooperation skills, and communication skills. Educational ecology research can be traced back to the 1940s, which is an interdisciplinary field of ecological education integration. It attaches great importance to the knowledge of the relationship between the learner's behavior and the learning environment. Three spirits are emphasized here, namely, integration, connection, and balance methods. All in all, ecology is used here as a way of thinking, teaching, and thinking. We believe that the evidence of learning cannot be based on the causal (or related) connection between certain things to establish the content of the input and output. New methods need to be developed to observe the learning context and process and record reasonable or actual learning opportunities or occasions [4]. The research outlines three perceivable trends, and it highlights current contention issues and provides some useful insights. The research clarifies three academic trends [5]. They are method after method; method in method; and complexity method. Some concluding remarks may contribute to ecological construction [6].

2.2. Family Ecological Teaching Method. As mentioned earlier, ecology is not a single method or even a theory. It is

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more of a worldview and a way of working. It can inspire a variety of research and practice [7]. Ecological education mainly includes three meanings: the principle, method, and purpose of education.

The ecological approach treats the learner as a whole, rather than a grammatical production unit. This includes doing meaningful things and saying, taking it seriously, taking responsibility, and being encouraged to meet challenges. Project, think critically, and control your own learning [8]. Chen et al. studied the application of artificial intelligence in health monitoring. They designed a "smart clothing" that can covertly collect various physical indicators of the human body and monitor the health of the human body at any time [9]. The article proposes teaching strategies [10] such as setting reasonable teaching goals and constructing scientific teaching content [11]. It is recommended that teachers make full use of network resources and encourage students to study cooperatively in the classroom [12]. Teachers should give positive comments to students and give encouragement in class. For this reason, some people propose an ecological teaching method [13], and improve the oral English teaching level of college students by establishing an ecological thinking-oriented college English teaching framework [14].

2.3. Methods of English Teaching Evaluation

2.3.1. Chromatographic Analysis Method. The chromatographic analysis method is an analysis method composed of chromatographic separation technology and appropriate detection means. It is an effective method to solve the problem of multiindex and multilevel weight. The calculation formula is

$$M_i = \frac{C}{\sum_{k=0}^{n} C_n}, \tag{1}$$

where C is the geometric mean of the index in row C_n.

2.3.2. Test Method. Reliability test refers to the reliability test of the questionnaire, which reflects the degree of the actual situation. Commonly used reliability test methods include retest reliability, parallel test reliability, parallel test reliability, and homogeneity reliability. The correlation coefficient of the two measurement results can be used to express the reliability. The retest reliability formula is as follows:

$$E_t = \frac{\sum xy - 1/n\left(\sum x\right)\left(\sum y\right)}{\sqrt{\left[\sum x^2 - 1/n\left(\sum x\right)^2\right]\left[\sum y^2 - 1/n\left(\sum y\right)^2\right]}}. \tag{2}$$

Among them, $\sum x$ and $\sum y$ represent the results of the previous and subsequent tests.

The formula for the significance test for comparing the difference between means is

$$\text{is: } t = \frac{x_1 - x_2}{\sqrt{\alpha_{x_1}^2 + \alpha_{y_1}^2 - 2r\alpha x_1 \alpha x_2/n - 1}}. \tag{3}$$

Commonly used analysis methods for evaluator's reliability are Spearman correlation coefficient method, kappa coefficient method, Kendall harmony coefficient method, and Kronbach method's. According to the characteristics and ease of operation of this research, this study chooses the Kronbach's method to evaluate the reliability of evaluators. It is a set of commonly used methods to measure the reliability of psychological or educational tests. The calculation formula of Kronbach's method is as follows:

$$\beta = \left(\frac{K}{k-1}\right)\left(1 - \frac{\sum\sum x^2/n - \sum\sum (x)^2/n^2}{1 - \sum x_t^2/n - \sum x_t^2/n^2}\right). \tag{4}$$

3. Implementation of the Experiment

All the factors involved in the English writing teaching course play a unique role in this process. This section is an introduction to the realization of the experiment in this article.

3.1. Teaching Design. The three specific teaching procedures will be detailed in the following [15].

3.1.1. Import. Introduction is a very important part of the whole process, and it is related to the teaching preparation of teachers and students. First of all, the teacher sets the teaching goals of this course and clarifies the teaching principles used in this course [16]. Secondly, the teacher provides students with background knowledge of the course before presenting learning materials to students [17].

3.1.2. Statement. In this step, teachers will organize the learning materials and teach them according to their complexity and difficulty. Then, teachers should display learning materials through multimedia teaching equipment, such as Power Point or video display platforms. In addition, teachers should try their best to use verbal expressions to attract students' attention to the possible methods of teaching the language or non-verbal behavior [17].

3.1.3. Reflection and Summary. It is said that teachers can benefit from reflection after class. If teachers can take conscious action to think about the entire class and everyone in the classroom, if they can carefully check the interaction between teachers and students in the classroom, teachers will surely get a lot of information that has teaching and its effects [11]. Reflective exercises after class enable teachers to participate more in their teaching roles and work in teaching knowledge and facilitate them to cope with the lack of scientific facts and the uncertainty of knowledge in teaching disciplines [12, 18]. All teachers should be active in class. The teacher should review the main points of the teacher's language, teaching and summarizing their teaching experience.

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Table 1: Analysis of students' interest and attitude towards writing.

(1) Teaching topic	Writing an essay according to the same direction as CET-4.
(2) Teaching objectives	How to make the students write a coherent and qualified essay.
(3) Key points	The important words, sentence structure, rhetorical devices, etc.
(4) Teaching aids	Computer, video projecting platform, and Power Point.
(5) Teaching method	Teacher-student discussion, student-student discussion, etc.
(6) Teaching procedure	There are nine steps in this teaching procedure.

3.2. Teaching Plan. This section outlines the teaching plan for this ecological teaching method. The figure below shows a clear teaching plan for this ecological teaching method [19].

In this study's experiment, it was used in college English writing. Table 1 shows that it may be generally divided into six segments.

3.2.1. Introduction. The teacher should carefully select the composition of the sample and show the composition class that has typical mistakes or mistakes commonly made by students as a whole.

3.2.2. Group Discussion. The teacher gives the students a few minutes to discuss their drafts to make their expressions and drafts more consistent. The teacher allows students to learn from other students and imitate other sentence structures and rhetoric techniques. Students can learn more about writing and revision by reading each other's drafts carefully.

Then, ask some students to give a speech about their ideas about writing on the topic and introduce key language points or sentence structures they might think of for a particular work.

3.2.3. Teacher Feedback. The teacher can show the model to the whole class and show the students how to write this kind of text. Moreover, teachers can provide students with more use of good sentence structure and rhetoric that can be used to achieve the desired goals in the writing process.

3.2.4. Composition Writing. With the help of key points and sentence structure instructions, ask students to write down their main ideas and their structure and then write down drafts of their own ideas. Students should draft their own drafts first and then take the first draft.

4. Data Analysis before the Questionnaire Survey

In order to find out the students' current English writing level and their writing attitude, the questionnaire is to test students' writing habits and strategies used in writing. We listed 15 questions in the questionnaire to clearly illustrate the student's performance in the last writing class. The 15-question questionnaire can be divided into four parts. Questions 1 to 4 are designed to test students' interest and attitude towards writing lessons. Questions 7 to 12 are designed to understand students' writing habits and writing strategies. The last three questions, questions 13 to 15, are designed to understand how students really feel about the previous writing class. Forty-nine questionnaires were distributed to the class, all valid. The results are shown in Table 2.

The first four questions in Table 1 and Figures 1 and 2 are designed to help you understand students' interest and attitude towards writing.

Through the analysis of Figures 1 and 2, it can be concluded that most students (about 67.35%) did not show much interest in writing in English. Only a few students (12.24%) like writing and writing. Among all subjects, only 10.20% of people think English writing is easy. The results show that most students do not like writing and most subjects have a negative attitude towards English writing. The result from question 4 shows that more than half (57.15%) of students do not like writing English lessons. Only 10% of the subjects are English writing classes and most students are not interested in English writing classes. From the results of questions 1–4, we can conclude that most students show little interest in English writing, hold a negative attitude towards English writing and lack confidence in English writing.

The two questions in Table 3 are designed to understand the motivation of students in the learning process before the writing teaching experiment. From the answer to question 5, it can be seen that only about 8% of the subjects have the impression that writing in English is important for improving other skills in English learning. More than half of the answers indicate that English writing has little importance in improving other English skills.

From Figures 3 and 4, we can draw a preliminary conclusion that most students do not think that English writing is an important skill for other languages. From question 6, we can see that most students (89%) think writing is just a heavy burden and will not arouse people's interest. For college students writing is just a task that can enable them to obtain academic grades. Only a small part of them are interested in English writing in daily life. They really like to express their true feelings and thoughts about specific events in English. From the data in questions 5 and 6, we can know that most students think they are forced to write in English by their teachers. We can conclude that correct and positive writing motivation is what students lack in the writing process, which makes them bear a heavy burden to complete the writing task.

5. Conclusions

Based on multimodal discourse theory, this paper discusses how to introduce multimodal teaching mode in the actual

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Table 2: Analysis of students' interest and attitude towards writing.

Questions 1–4		Total	Percent	Total	Percent	Total	Percent	Total	Percent
Interest and attitude	1	6	12.24	10	20.41	26	53.06	7	14.29
	2	5	10.2	11	22.45	23	46.94	10	20.41
	3	2	4.08	12	24.49	29	59.18	6	12.24
	4	5	10.2	16	32.65	20	40.82	8	16.33

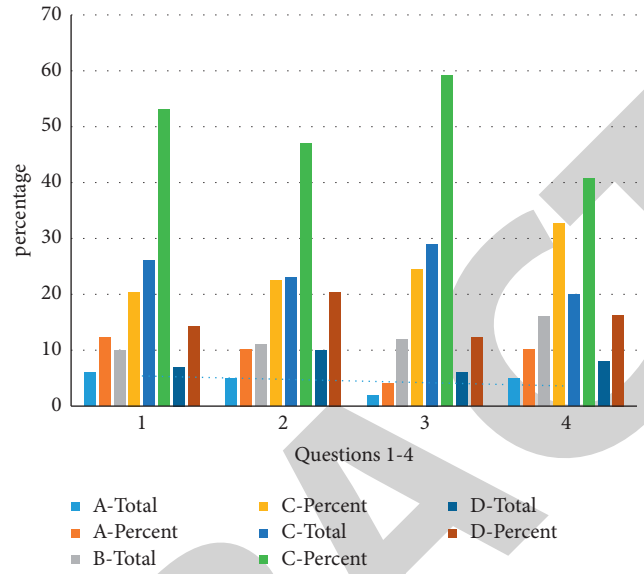

Figure 1: Analysis of students' interest and attitude towards writing.

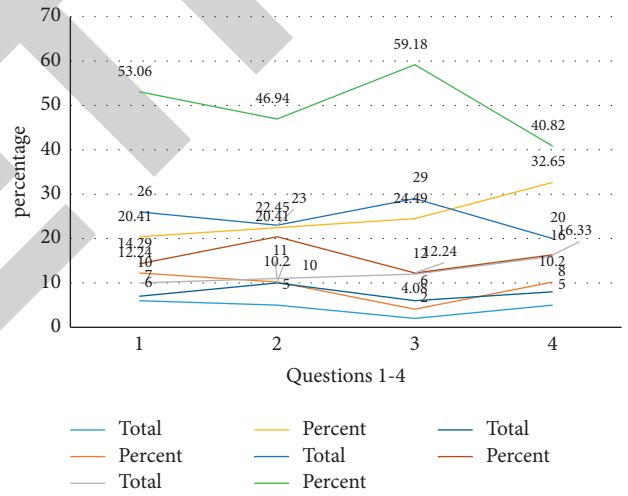

Figure 2: Analysis of students' interest and attitude towards writing.

Table 3: Analysis of students' motivation of writing.

Questions 5–8		Total	Percent	Total	Percent	Total	Percent	Total	Percent
Interest and attitude	5	8	16.33	34	69.39	6	12.24	1	2.04
	6	4	8.16	28	57.14	16	32.65	1	2.04

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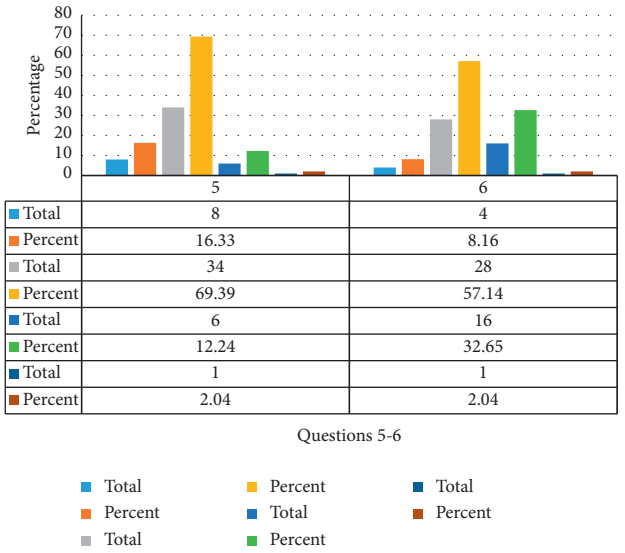

	5	6
Total	8	4
Percent	16.33	8.16
Total	34	28
Percent	69.39	57.14
Total	6	16
Percent	12.24	32.65
Total	1	1
Percent	2.04	2.04

Figure 3: Analysis of students' interest and attitude towards writing.

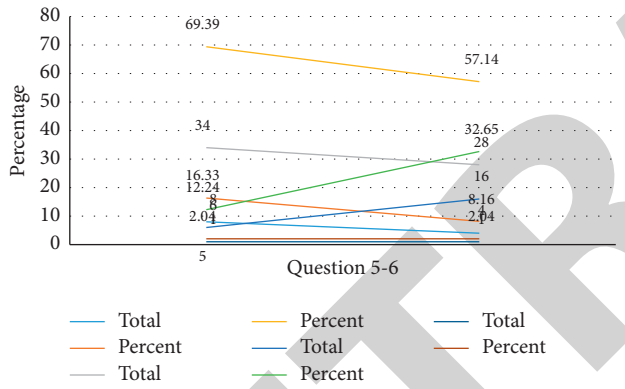

Figure 4: Analysis of students' interest and attitude towards writing.

process. In this section, the authors first summarize the conclusions of the teaching experiment, then explain the problems in the process of multimodal oral research and receiving education and teaching, and finally analyze and summarize the limitations of this research. In this study, the authors conducted an experimental study of multimodal oral teaching at Xi'an International Studies University. There are two independent variables in the experiment, which are two different teaching modes. First, the control class uses traditional oral teaching methods for teaching, while the experimental class uses a variety of teaching methods for teaching. The dependent variable is the student's oral test score, and the object can be analyzed in all dimensions of the student's performance through the object. From the previous discussion, it can be concluded that the ecological teaching method is conducive to students' performance in English writing in college composition writing. The present ecological teaching style is more suited to the teaching of college English writing than traditional teaching methods. The new teaching model is more effective than the traditional teaching method in teaching writing. To sum up, the application of artificial intelligence in language teaching is conducive to the optimization of students' learning experience and the improvement of learning effectiveness, which is conducive to the improvement of teaching effect.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

[1] I. A. T. Hashem, V. Chang, N. B. Anuar et al., "The role of big data in smart city," *International Journal of Information Management*, vol. 36, no. 5, pp. 748–758, 2016.

[2] L. Xu, C. Jiang, J. Wang, J. Yuan, and Y. Ren, "Information security in big data: privacy and data mining," *IEEE Access*, vol. 2, no. 2, pp. 1149–1176, 2014.

[3] Y. Zhang, M. Qiu, C. W. Tsai, M. M. Hassan, and A. Alamri, "Health-CPS: healthcare cyber-physical system Assisted by cloud and big data," *IEEE Systems Journal*, vol. 11, no. 1, pp. 88–95, 2017.

[4] Z. Obermeyer and E. J. Emanuel, "Predicting the future–big data, machine learning, and clinical medicine," *New England Journal of Medicine*, vol. 375, no. 13, pp. 1216–1219, 2016.

[5] M. M. Rathore, A. Ahmad, A. Paul, and S. Rho, "Urban planning and building smart cities based on the internet of things using big data analytics," *Computer Networks*, vol. 101, no. C, pp. 63–80, 2016.

[6] E. Baccarelli, N. Cordeschi, A. Mei, M. Panella, M. Shojafar, and J. Stefa, "Energy-efficient dynamic traffic offloading and reconfiguration of networked data centers for big data stream mobile computing: review, challenges, and a case study," *Computers & Chemical Engineering*, vol. 91, no. 2, pp. 182–194, 2016.

[7] A. De Mauro, M. Greco, and M. Grimaldi, "A formal definition of big data based on its essential features," *Library Review*, vol. 65, no. 3, pp. 122–135, 2016.

[8] E. D. Siew, R. K. Basu, H. Wunsch et al., "Optimizing administrative datasets to examine acute kidney injury in the era of big data: workgroup statement from the 15th ADQI consensus conference," *Canadian Journal of Kidney Health and Disease*, vol. 3, no. 1, pp. 98–12, 2016.

[9] M. Chen, Y. Ma, J. Song, C. F. Lai, and B. Hu, "Smart clothing: connecting human with clouds and big data for sustainable health monitoring," *Mobile Networks and Applications*, vol. 21, no. 5, pp. 825–845, 2016.

[10] S. Athey, "Beyond prediction: using big data for policy problems," *Science*, vol. 355, no. 6324, pp. 483–485, 2017.

[11] L. Zhang, Y. Gao, C. Hong, Y. Feng, J. Zhu, and D. Cai, "Feature correlation hypergraph: exploiting high-order potentials for multimodal recognition," *IEEE Transactions on Cybernetics*, vol. 44, no. 8, pp. 1408–1419, 2014.

[12] S. Poria, E. Cambria, N. Howard, G.-B. Huang, and A. Hussain, "Fusing audio, visual and textual clues for sentiment analysis from multimodal content," *Neurocomputing*, vol. 174, no. PA, pp. 50–59, 2016.

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[13] Y. Li, J. Pan, J. Long et al., "Multimodal BCIs: target detection, multidimensional control, and awareness evaluation in patients with disorder of consciousness," *Proceedings of the IEEE*, vol. 104, no. 2, pp. 332–352, 2016.

[14] C. Zu, B. Jie, M. Liu, S. Chen, D. Shen, and D. Zhang, "Label-aligned multi-task feature learning for multimodal classification of Alzheimer's disease and mild cognitive impairment," *Brain Imaging and Behavior*, vol. 10, no. 4, pp. 1148–1159, 2016.

[15] P. Wild, P. Radu, L. Chen, and J. Ferryman, "Robust multimodal face and fingerprint fusion in the presence of spoofing attacks," *Pattern Recognition*, vol. 50, no. C, pp. 17–25, 2016.

[16] T. Ohsawa, T. Horiguchi, and M. Mitsuhashi, "Multimodal analysis of prompt neutron spectra for 238Pu(sf), 240Pu(sf), 242Pu(sf) and 239Pu(nth,).f," *Nuclear Physics A*, vol. 665, no. 1-2, pp. 17–26, 2016.

[17] S. I. Kim, K. Y. Ha, and I. S. Oh, "Preemptive multimodal analgesia for postoperative pain management after lumbar fusion surgery: a randomized controlled trial," *European Spine Journal*, vol. 25, no. 5, pp. 1614–1619, 2016.

[18] L. Qiao, Y. Li, D. Chen, S. Serikawa, M. Guizani, and Z. Lv, "A survey on 5G/6G, AI, and robotics," *Computers & Electrical Engineering*, vol. 95, Article ID 107372, 2021.

[19] Z. Lv, Y. Han, A. K. Singh, G. Manogaran, and H. Lv, "Trustworthiness in industrial IoT systems based on artificial intelligence," *IEEE Transactions on Industrial Informatics*, vol. 17, no. 2, pp. 1496–1504, 2021.

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