

Research on Intelligent Management Platform of Bid Evaluation Site Based on Biometrics and Wireless Pulse Positioning Technology

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Abstract: *Based on the Internet of Things and mobile Internet technology, the project combines biometric technology and wireless pulse positioning technology to realize the application of RFID technology. Intelligent terminal, mobile recorder, recording phone, camera, face recognition machine, face recognition machine and other intelligent terminals, the development of intelligent positioning, intelligent access control, "health +" intelligent life, intelligent monitoring, and intelligent App application, to realize the comprehensive perception and interaction between people and things, people and technology, to provide people with convenient and efficient life services. The establishment of an "intelligent site management platform" effectively solves the problems of experts in the process of bid evaluation, illegal "visit" evidence is difficult, and experts' working time is not scientific enough. The system can effectively play the role of bid evaluation, reduce the workload of supervision work, and improve the efficiency and quality of supervision work. The establishment of this system makes up for the deficiency of tendering and bidding site management, makes China Mobile more efficient, safe, standardized, and transparent in tendering and bidding site management, and greatly improves the intensive management level of the company's resource management. To this end, this paper will focus on biometrics.*

Keywords: Biometrics; Wireless pulse positioning technology; Bid evaluation site; Intelligent management platform.

The reviewed literature showcases significant progress in image processing tasks. Tian et al. (2024) advance medical image analysis by enhancing U-Net architecture for brain tumor segmentation using GSConv and ECA attention mechanisms, improving both accuracy and efficiency. Chen et al. (2022) improve object recognition with a one-stage object referring method incorporating gaze estimation, effectively leveraging visual attention. Chen et al. (2020) demonstrate the practical application of deep learning in industrial quality control by automating the grading of printed mottle defects. Finally, Wu et al. (2024) contribute a lightweight GAN-based image fusion algorithm for visible and infrared images, improving image quality in multi-spectral applications. These studies highlight the versatility and effectiveness of deep learning in various image-related tasks. The application of NLP and LLMs is evident in several studies. Ren (2024) presents a novel approach for smoking detection using image-based behavior recognition, a significant contribution to computer vision and human behavior analysis. Luo et al. (2024) improve e-commerce chatbots using the Falcon-7B LLM and 16-bit quantization, enhancing performance and efficiency. Xu et al. (2024) directly address crucial adoption challenges by focusing on enhancing user experience and trust in LLM-based conversational agents. Ren (2024) further refines dialogue summarization techniques by improving Seq2Seq models for role-oriented conversations using adaptive feature weighting and dynamic statistical conditioning. These advancements highlight the continuous development and diverse applications of LLMs in various interactive and information processing tasks. Several papers demonstrate the power of AI and ML in data analysis and forecasting. Wang et al. (2024) introduce an asynchronous LLM architecture for real-time event stream analysis using camera data, demonstrating significant advancements in multi-source data processing. Qi and Liu (2024) highlight the importance of big data tools in business intelligence by designing a sales forecasting system using Hadoop. Chen et al. (2024) offer a foundational understanding of various data mining methods and algorithms. Bi et al. (2024) present a financial intelligent risk control platform based on big data analysis and deep machine learning, showcasing the practical applications of these technologies in financial risk management. Bi et al. (2024) further investigate the potential and limitations of LLMs like ChatGPT for financial forecasting. Li et al. (2024) utilize data analysis to explore the complex relationship between technological advancements, financial policies, and green innovation, underscoring the broader societal impact of these technologies. Xu et al. (2024) investigate experience management tools in the electric vehicle market, focusing on customer perceived value. Lin et al. (2024) review precision anesthesia techniques for high-risk surgical patients, highlighting advancements in patient safety. Chen and Bian (2019) present advancements in streaming media technology with their MSE-based live broadcast system. Liang and Chen (2019) focus on network security by introducing a SDN-based hierarchical authentication mechanism for IPv6. Awotunde et al. (2021) and Hasan et al. (2020) provide valuable context on the impact of big data within the financial

technology sector. VenkateswaraRao et al. (2023) present a big data analytics-based credit investigation and risk management system for commercial banking. Li (2024) enhances e-commerce product recommendations using multimodal data and multi-recall strategies. Chen et al. (2024) focus on AI-driven threat detection in cybersecurity. Shakya and Smys (2021) explore improved risk management and customer segregation in banking using big data analytics. Ravi and Kamaruddin (2017) offer an overview of the opportunities and challenges associated with big data analytics in smart financial services. Wang et al. (2024) apply LLM connection graphs for global feature extraction in point cloud analysis. Xu et al. (2024) demonstrate the application of YOLOv5 in automated surveillance for detecting crown-of-thorns starfish.

1. BUSINESS STATUS OF DOMESTIC BID EVALUATION BASES

At present, China's procurement model mainly relies on batch centralized procurement, which is difficult to meet the needs of diversification, regionalism, differentiation, small batch procurement, and emergency procurement. This type of bidding and procurement activity requires a large number of experts, and requires a long period of closed management during the evaluation process, which will weaken the professional ethics and ethics of bidding and procurement. In this context, although evaluation experts have rich theoretical knowledge and practical work experience in their respective professional fields, their expertise varies greatly due to different industries and types, making it difficult to ensure the quality of evaluation work. Due to the difficulty of managing construction sites, most evaluation bases have been in operation for many years, and their software and hardware equipment cannot meet the requirements of intelligent management of evaluation sites. The on-site management is extensive, the technical standards are not high, and the abilities of some management and technical personnel are not yet able to meet the needs of actual work. The main content is as follows:

1.1 The efficiency of the expert registration process is low

The work of review experts is still manual review, with complicated procedures and a large influx of experts, resulting in "accumulation", crowding, and low work efficiency, and chaotic on-site management. At the same time, due to the lack of relevant professional knowledge and experience in the evaluation work, there are problems such as unscientific and "blind command" in the evaluation work.

1.2 Insufficient management methods for expert attendance

During the evaluation process, expert attendance is entirely done by paper-based manual labor, which can only perform simple tasks and cannot effectively play its role. Specialized personnel are required for sign in and sign back, which is a complex process, labor-intensive, prone to errors, fraud, difficult to control, and inconvenient for storage. Managing solely based on drawing data is not only difficult, but also incomplete and untimely. Due to significant differences in experts' professional knowledge, analytical perspectives, experience, and other aspects, and the fact that most evaluations are based on qualitative analysis, subjectivity is strong and difficult to believe.

1.3 Unable to notify major activities in real-time

The staff of the evaluation committee must hand over all communication equipment to the evaluation committee, without any communication tools. If there is anything important that cannot be notified to professionals in a timely manner, the staff need to go to the conference room one by one to search for it. In addition, there are still problems in China such as low information utilization rate, slow data processing, and serious lack of technical exchange, which have hindered the development of comprehensive analysis technology in our country.

1.4 Difficulty in achieving comprehensive coverage of on-site supervision

At the bidding site, it is difficult to meet the requirements of full coverage and no blind spots by relying solely on supervisors for routine operations. At the same time, the entry and exit of evaluation personnel or those related to bidding interests cannot be detected and on-site evidence cannot be obtained in a timely manner. The work done by third-party evaluation companies is related to their own interests, while third-party evaluation companies consider their work to be highly specialized and non professional. Due to the susceptibility of evaluation results to external influences, the accuracy of the evaluation is not high.

1.5 Lack of guarantee for the physical and mental health of experts

Due to the single content and long duration of the evaluation management project, coupled with the adoption of closed management, the entertainment activities of the evaluation management personnel during the evaluation work are relatively simple, without providing physical and psychological protection for experts. In a certain sense, this weakens the enthusiasm of the evaluation management experts to participate in the evaluation management project, resulting in low enthusiasm of the evaluation management experts. In this context, although evaluators have a wealth of theoretical and practical knowledge in their disciplines, their professional knowledge varies greatly due to different fields and levels, resulting in the inability to guarantee the standards of the evaluation project.

2. RESEARCH AND PRACTICE ON INTELLIGENT DEVICE CONTROL SCHEME

In the context of the new era, the centralized procurement method of the electricity market must rely on new network technologies such as mobile applications and big data to achieve intelligent operation of the electricity market. By establishing diversified cooperation mechanisms, the quality of bidding work can be continuously improved. The innovation of enterprise business models with new ideas and technologies has promoted the development of enterprise information platform, automation, and intelligence, realizing the visualization, collaborative operation, and information support of material supply business to ensure intelligent upgrading of business.

2.1 Develop an intelligent security control using biometric technology

Biometric technology (as shown in Figure 1) simplifies the entry process by verifying the identity of the evaluation experts and facilitating human-computer interaction, effectively avoiding the hassle of judges' review and entry. We adopted a method of random sampling and centralized management by experts to prevent data leakage and ensure the selection of expert groups and the confidentiality of data. In bidding, the use of "expert" technology can greatly reduce the workload of evaluation and improve the quality of evaluation work.

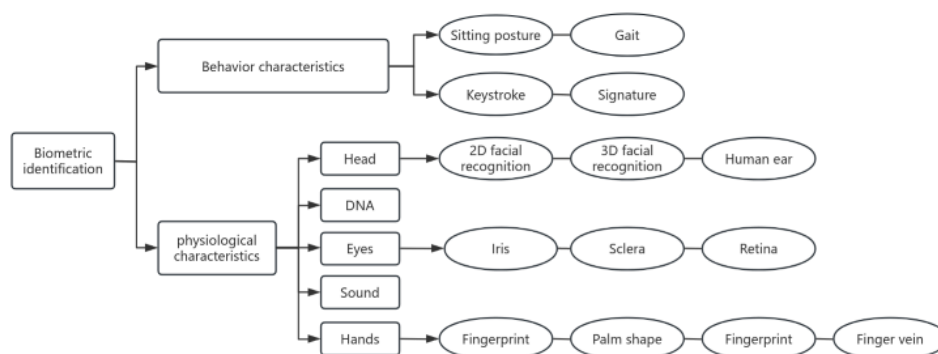


Figure 1: Biometric recognition technology

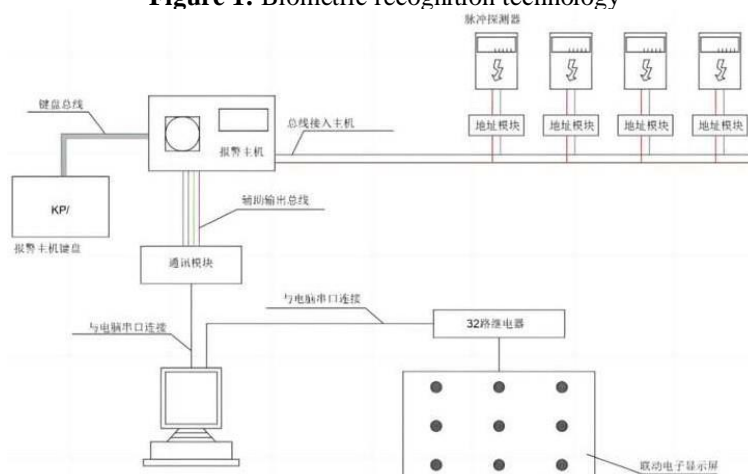


Figure 2: Electronic fence technology

2.2 Reasonable division of bidding locations using electronic fence technology

The working time of electronic fence technology (as shown in Figure 2) will be automatically recorded after personnel arrive at the work area. We have conducted a visual evaluation of the work efficiency, productivity, and hardship index of the staff, and used it as a measurement standard for performance evaluation. By defining and analyzing the concept of 'workload', it is possible to effectively limit the number of experts involved during a specific period, ensuring its effectiveness and high quality.

2.3 Use high-precision wireless pulse positioning technology to monitor the on-site location of bidders.

By tracking its movement trajectory and comparing it in real-time with the corresponding area, it can be determined whether there is any violation. This can prevent "black box operations" between bidders and promote fairness and impartiality in the bidding process. Once a master reaches the side of a superpower, the platform will automatically issue an alert, transmit the information to specialized personnel, and then enter it into the platform's database.

2.4 Building a Smart Residential Environment Based on HTML5 LAN+Technology

This system can achieve real-time monitoring of bidding personnel and automated monitoring of the bidding site, solving the long-standing problem of "insecurity" that has plagued "evaluation personnel". By adopting a standardized and procedural design approach, the development process of the system has been reduced, the difficulty of the system has been minimized, and the operating costs of the system have been lowered. This system fundamentally solves the shortcomings of traditional management methods, meets the specific needs of standardized and intelligent construction, reduces the workload of management work, and also significantly improves the overall efficiency of the enterprise.

2.5 Monitoring through dedicated network access

Expert mobile phones, workspace video surveillance, real-time audio, video (on-site monitoring mobile phones), and monitoring of the entire process work records are used to collect data on sensitive fields and behaviors of phone calls, achieving standardized and procedural supervision of expert inspections. At the same time, by introducing "expert" technology to conduct on-site monitoring of experts, the workload has been reduced, and the efficiency and level of management have been improved.

2.6 Build a 5G dedicated mobile phone 5G dedicated network and configure intelligent terminals for experts

Through application software, experts can understand the needs of bidding work in real time, grasp the situation of bidding work in real time, and be able to monitor the operation status of the bidding process in real time, facilitating effective supervision and control by staff. Conduct anti-corruption propaganda, training, watch movies, read e-books, read phone messages, etc. According to the actual situation of the community, it has been renovated and transformed to make it more humane.

3. BENEFIT ANALYSIS OF RESEARCH RESULTS APPLICATION

3.1 Social benefits

Tendering and bidding are organized by professionals from various industries, with the aim of creating "efficient, safe, and transparent" bidding activities through product innovation, promoting public participation, creating a good environment where everyone cares about and pays attention to product quality, and promoting the formation of a social governance pattern. Bidding agency is an important link in China's public resource trading, which plays a significant role in maintaining market order, improving transaction efficiency, and ensuring fairness and impartiality in transactions. Standardized bidding can effectively reduce customer complaints, improve market fairness, and promote the healthy development of enterprises. Purchase high-quality equipment (business) for the company, establish a good brand and good economic benefits for the company.

3.2 Economic benefits

This system adopts advanced intelligent terminal technology, which can record the time of expert evaluation in real time and accurately, laying a good foundation for expert evaluation and scientific and reasonable arrangement of bid evaluation work; At the same time, the introduction of an expert evaluation mechanism has effectively played the role of bid evaluation supervision, reduced the workload of supervision work, and significantly improved the efficiency and quality of supervision work. Reduced manpower and material resources, improved production management and utilization efficiency of the enterprise. We will continue to adhere to the business philosophy of "quality first, technology first", and meet the needs of our customers with more professional, fast, reliable, and high-quality products. To provide fair, scientific, accurate, and efficient detection technology for the industry and make greater contributions to its development.

3.3 Management benefits

With "intelligence+efficiency+speed+safety+integrity+care+guarantee" as the core, through the integration of intelligent devices and intelligent management platforms, standardized management of bid evaluation experts in all aspects such as registration, check-in, attendance, positioning, reminders, notifications, and distress can be achieved; Promote business innovation through technological innovation, achieve system linkage, intelligent warning, optimize processes, improve efficiency, and enhance the overall level of safety production. Based on the overall structure of the intelligent training center management system, five intelligent management modules have been established: comprehensive information portal intelligent management, intelligent access control management, remote video monitoring, open management, and engineering database management. Through the comprehensive management platform, centralized management of various sub projects such as access control, video, alarm, emergency, network, and big data has been achieved, providing comprehensive professional services for each project.

4. CONCLUSION

In summary, this article has solved a series of key technologies such as residual value assessment and rapid detection through technological innovation, and has improved technical standards and specifications. By establishing a modern, intelligent, and humanized evaluation and supervision management model, the occupational health management capabilities of evaluation units have been improved. Not only have solutions and requirements been proposed to solve problems, but risk points and levels have also been clarified and classified for management. This has significantly improved the occupational health management level of evaluation enterprises, set a benchmark for similar enterprises, and formed a good experience that can be learned and replicated. In order to make the on-site management of bid evaluation experts more professional and standardized, thereby improving the operational efficiency of the enterprise.

REFERENCES

- [1] Xu Y, Shan X, Guo M, Gao W, Lin Y-S. Design and Application of Experience Management Tools from the Perspective of Customer Perceived Value: A Study on the Electric Vehicle Market. *World Electric Vehicle Journal*. 2024; 15(8):378. <https://doi.org/10.3390/wevj15080378>
- [2] Z. Ren, "A Novel Feature Fusion-Based and Complex Contextual Model for Smoking Detection," 2024 6th International Conference on Communications, Information System and Computer Engineering (CISCE), Guangzhou, China, 2024, pp. 1181-1185, doi: 10.1109/CISCE62493.2024.10653351.
- [3] Wang, Z., Chu, Z. C., Chen, M., Zhang, Y., & Yang, R. (2024). An Asynchronous LLM Architecture for Event Stream Analysis with Cameras. *Social Science Journal for Advanced Research*, 4(5), 10-17.
- [4] Lin, S., Tan, H., Zhao, L., Zhu, B., & Ye, T. (2024). The Role of Precision Anesthesia in High-risk Surgical Patients: A Comprehensive Review and Future Direction. *International Journal of Advance in Clinical Science Research*, 3, 97-107.
- [5] Chen, H., & Bian, J. (2019, February). Streaming media live broadcast system based on MSE. In *Journal of Physics: Conference Series* (Vol. 1168, No. 3, p. 032071). IOP Publishing.
- [6] Tian, Q., Wang, Z., Cui, X. Improved Unet brain tumor image segmentation based on GSConv module and ECA attention mechanism. *arXiv preprint arXiv:2409.13626*.
- [7] Luo, Y., Wei, Z., Xu, G., Li, Z., Xie, Y., & Yin, Y. (2024). Enhancing E-commerce Chatbots with Falcon-7B and 16-bit Full Quantization. *Journal of Theory and Practice of Engineering Science*, 4(02), 52–57. [https://doi.org/10.53469/jtpes.2024.04\(02\).08](https://doi.org/10.53469/jtpes.2024.04(02).08)

- [8] Xu, Y., Gao, W., Wang, Y., Shan, X., & Lin, Y.-S. (2024). Enhancing user experience and trust in advanced LLM-based conversational agents. *Computing and Artificial Intelligence*, 2(2), 1467. <https://doi.org/10.59400/cai.v2i2.1467>
- [9] Chen, J., Zhang, X., Wu, Y., Ghosh, S., Natarajan, P., Chang, S. F., & Allebach, J. (2022). One-stage object referring with gaze estimation. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* (pp. 5021-5030).
- [10] Qi, T., & Liu, H. (2024, September). Research on the Design of a Sales Forecasting System Based on Hadoop Big Data Analysis. In *Proceedings of the 2024 2nd International Conference on Internet of Things and Cloud Computing Technology* (pp. 193-198).
- [11] Liang, X., & Chen, H. (2019, July). A SDN-Based Hierarchical Authentication Mechanism for IPv6 Address. In *2019 IEEE International Conference on Intelligence and Security Informatics (ISI)* (pp. 225-225). IEEE.
- [12] Chen, J., Lin, Q., & Allebach, J. P. (2020). Deep learning for printed mottle defect grading. *Electronic Imaging*, 32, 1-9.
- [13] Bi, S., Lian, Y., & Wang, Z. (2024). Research and Design of a Financial Intelligent Risk Control Platform Based on Big Data Analysis and Deep Machine Learning. *arXiv preprint arXiv:2409.10331*.
- [14] Awotunde, J. B., Adeniyi, E. A., Ogundokun, R. O., & Ayo, F. E. (2021). Application of big data with fintech in financial services. In *Fintech with artificial intelligence, big data, and blockchain* (pp. 107-132). Singapore: Springer Singapore.
- [15] Hasan, M. M., Popp, J., & Oláh, J. (2020). Current landscape and influence of big data on finance. *Journal of Big Data*, 7(1), 21.
- [16] Chen, T., Lian, J., & Sun, B. (2024). An Exploration of the Development of Computerized Data Mining Techniques and Their Application. *International Journal of Computer Science and Information Technology*, 3(1), 206-212.
- [17] Z. Ren, "Enhancing Seq2Seq Models for Role-Oriented Dialogue Summary Generation Through Adaptive Feature Weighting and Dynamic Statistical Conditioning," 2024 6th International Conference on Communications, Information System and Computer Engineering (CISCE), Guangzhou, China, 2024, pp. 497-501, doi: 10.1109/CISCE62493.2024.10653360.
- [18] VenkateswaraRao, M., Vellela, S., Reddy, V., Vullam, N., Sk, K. B., & Roja, D. (2023, March). Credit Investigation and Comprehensive Risk Management System based Big Data Analytics in Commercial Banking. In *2023 9th International Conference on Advanced Computing and Communication Systems (ICACCS)* (Vol. 1, pp. 2387-2391). IEEE.
- [19] Lu, J. (2024). Enhancing Chatbot User Satisfaction: A Machine Learning Approach Integrating Decision Tree, TF-IDF, and BERTopic.
- [20] Wang, Z., Zhu, Y., Chen, M., Liu, M., & Qin, W. (2024). Llm connection graphs for global feature extraction in point cloud analysis. *Applied Science and Biotechnology Journal for Advanced Research*, 3(4), 10-16.
- [21] Xu, G., Xie, Y., Luo, Y., Yin, Y., Li, Z., & Wei, Z. (2024). Advancing Automated Surveillance: Real-Time Detection of Crown-of-Thorns Starfish via YOLOv5 Deep Learning. *Journal of Theory and Practice of Engineering Science*, 4(06), 1-10. [https://doi.org/10.53469/jtpes.2024.04\(06\).01](https://doi.org/10.53469/jtpes.2024.04(06).01)
- [22] Chen, H., Shen, Z., Wang, Y., & Xu, J. (2024). Threat Detection Driven by Artificial Intelligence: Enhancing Cybersecurity with Machine Learning Algorithms.
- [23] Shakya, S., & Smys, S. (2021). Big data analytics for improved risk management and customer segregation in banking applications. *Journal of IoT in Social, Mobile, Analytics, and Cloud*, 3(3), 235-249.
- [24] Ravi, V., & Kamaruddin, S. (2017). Big data analytics enabled smart financial services: opportunities and challenges. In *Big Data Analytics: 5th International Conference, BDA 2017, Hyderabad, India, December 12-15, 2017, Proceedings 5* (pp. 15-39). Springer International Publishing.
- [25] Li, L., Gan, Y., Bi, S., & Fu, H. (2024). Substantive or strategic? Unveiling the green innovation effects of pilot policy promoting the integration of technology and finance. *International Review of Financial Analysis*, 103781.
- [26] Li, S. (2024). Harnessing Multimodal Data and Mult-Recall Strategies for Enhanced Product Recommendation in E-Commerce.
- [27] Wu, Z., Chen, J., Tan, L., Gong, H., Zhou, Y., & Shi, G. (2024, September). A lightweight GAN-based image fusion algorithm for visible and infrared images. In *2024 4th International Conference on Computer Science and Blockchain (CCSB)* (pp. 466-470). IEEE.
- [28] Wang, Z., Yan, H., Wang, Z., Xu, Z., Wu, Z., & Wang, Y. (2024, July). Research on autonomous robots navigation based on reinforcement learning. In *2024 3rd International Conference on Robotics, Artificial Intelligence and Intelligent Control (RAIIC)* (pp. 78-81). IEEE.
- [29] Bi, S., Deng, T., & Xiao, J. (2024). The Role of AI in Financial Forecasting: ChatGPT's Potential and Challenges. *arXiv preprint arXiv:2411.13562*.