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APPLYING ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN INSTALLED VIDEO SURVEILLANCE SYSTEMS TO ENSURE THE SECURITY OF APARTMENTS

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Abstract: This scientific article examines the integration of artificial intelligence (AI) technologies into residential security systems to prevent apartment burglaries. Special attention is given to intelligent video surveillance systems installed in the entrances of multi-apartment buildings that can recognize residents, their relatives, and authorized trusted persons. The paper analyzes machine learning methods, computer vision, and biometric identification, as well as the advantages and limitations of their practical application. It is shown that the use of AI can significantly increase the level of security and enable a transition from passive monitoring to active crime prevention. The article also considers the problem of safeguarding residential premises under conditions of increasing burglary rates, discusses the constraints of traditional security systems, and substantiates the expediency of introducing AI into protection solutions. It is demonstrated that AI improves the effectiveness of preventing unlawful actions through intelligent data analysis and threat forecasting. Key implementation directions, as well as challenges and prospects for applying AI in everyday (household) security, are discussed.

Keywords: artificial intelligence, protective security, video surveillance, face recognition, building entrance, apartment burglaries, smart home.

Introduction

Apartment burglaries have for many years remained one of the most common forms of crime against private property. Despite the development of mechanical and electronic means of protection-such as locks, intercoms, and alarm systems-offenders continue to find ways to circumvent traditional security measures. A particularly vulnerable element of residential infrastructure is the entrance area of multi-apartment buildings, which serves as the primary access channel to apartments.

Ensuring the safety of residential premises is one of the pressing tasks of today's urbanized environment. Although security technologies are continually improving, the problem of apartment burglaries remains significant. Traditional protection systems, such as alarms and conventional video surveillance, in most cases merely record the fact of intrusion and do not provide intelligent situation analysis. Consequently, there is a need to introduce new technological solutions capable of increasing the level of preventive protection.

Traditional video surveillance systems installed in entrances typically perform only the function of recording a video archive. Recordings are analyzed post factum-after the offense has already been committed-which substantially reduces their effectiveness. Therefore, a relevant task is the deployment of intelligent technologies that can analyze video streams in real time and detect potential threats.

Analysis of existing residential security systems – modern apartment protection systems include security alarms, motion sensors, video cameras, and remote monitoring solutions.

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However, these tools usually operate according to predefined algorithms and do not possess the capability for self-learning and adaptation. This leads to a high share of false alarms and reduces user trust in security systems. In addition, such systems are generally unable to identify potential threats at early stages.

Artificial intelligence represents a promising direction in the development of protective security systems. Its application makes it possible to automate access control, recognize residents, their family members, and unfamiliar persons, and predict dangerous situations even before unlawful actions occur. To address this challenge, the present work proposes the integration of AI into home and apartment security systems to prevent apartment burglaries.

Methods

The concept of artificial intelligence in protective security systems – humans are the most complex objects available to our perception, and the ability to think is their principal attribute. Artificial intelligence is a field of science whose aim is to study and model this human attribute-thinking. In the context of building intelligent systems, two complementary approaches are typically distinguished.

In the top-down approach, the core tools include the laws of formal logic, set theory, graph theory, semantic networks, and other achievements of discrete mathematics and computing. The success of this approach is associated with advances in computing power and the art of programming, that is, with the progress of research areas collectively referred to as computer science. In contrast, the bottom-up approach (from low-level to high-level) is linked to advances in the sciences of humans. Both approaches are based on modeling: in the first case, the modeling is phenomenological and simulation-based, whereas in the second it is structural.

Artificial intelligence can also be defined as a set of methods and algorithms that enable computer systems to perform tasks that require intellectual human activity. In security systems, AI is used to analyze large volumes of data, support decision-making, and learn from previous experience.

Key AI Technologies Used in Protective Security – the main AI technologies applied in protective security include:

machine learning;
neural networks;
computer vision;
analysis of behavioral patterns.

Intelligent security systems can operate continuously, adapt to changes in the environment, and reduce the impact of the human factor.

Intelligent video surveillance systems in building entrances – Modern ai-enabled video surveillance systems significantly outperform traditional cameras in terms of functionality. they are capable not only of capturing images but also of analyzing them in real time.

The implementation of the proposed measures can be economically efficient: costs associated with mitigating the consequences of cyberattacks may be reduced, risks of equipment downtime and data loss may decrease, and improved security can reduce expenses for insuring information risks while strengthening organizational reputation. In the long term, this may support more sustainable development and reduce the total cost of ownership of IT infrastructure.

The main functions of intelligent video surveillance include:

motion detection;
face recognition;
object classification (person, animal, object);

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behavior analysis.

AI can detect suspicious actions, such as attempts to break doors, prolonged presence of unauthorized persons in an entrance area, or following a resident into the building without using keys.

Results

Recognition of relatives and trusted persons

One of the key functions of intelligent security systems is the recognition of individuals who are permitted access. For this purpose, a database is formed that may include:

- apartment residents;
- members of their families;
- relatives;
- trusted persons (nannies, caregivers, service personnel).

Deep learning algorithms analyze facial biometric characteristics and compare them with stored reference templates. If a match is found, the system classifies the person as an authorized individual and does not activate alarm scenarios.

If a face is not recognized or has a low similarity score, the system increases the level of monitoring and may notify residents or security services.

The Role of AI in Preventing Apartment Burglaries

The use of AI enables a shift from a reactive security model to a proactive one. The system does not merely record the fact of a crime; it can contribute to preventing it. Examples of situations detected by AI include:

repeated visits by an unknown person;
attempts to enter at night;
atypical behavior in an entrance area;
entry into the building without using an electronic key.
In such cases, the system can automatically:
send notifications to residents;
turn on additional lighting;
activate an audible alert;
save video footage with enhanced quality settings.

Discussion

Advantages and limitations of introducing ai into protective security

Advantages include:
high accuracy of face recognition;
reduction in the number of false alarms;
automation of monitoring and access-control processes;
an overall increase in the level of security;
a psychological deterrent effect for potential offenders.
Limitations include:
high implementation and maintenance costs;
the need to protect personal data;
possible algorithmic errors;
legal and ethical issues related to the use of biometrics.

Integration with the concept of a 'smart secure home – intelligent video surveillance systems can be integrated with other smart-home elements, including:

electronic locks;
motion sensors;

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lighting systems;
residents' mobile applications.

Such integration makes it possible to create a unified protective environment that adapts to user behavior and external conditions.

Conclusion

Integrating artificial intelligence into protective security systems for the entrances of multi-apartment buildings is an effective and promising approach for combating apartment burglaries. The use of technologies for recognizing relatives and trusted persons can restrict access for unauthorized individuals, increase the level of control, and enhance resident safety. Despite existing technical, legal, and organizational constraints, further development of AI and the improvement of the regulatory framework create conditions for broader adoption in residential infrastructure. We believe that incorporating such solutions into apartment security systems contributes to addressing and preventing apartment burglaries.

References

1. Russell, S., & Norvig, P. (2021). Artificial Intelligence: A Modern Approach. Moscow: Williams.
2. Goodfellow, I., Bengio, Y., & Courville, A. (2016). Deep Learning. Cambridge, MA: MIT Press.
3. Zeng, Z. (2020). Intelligent Video Surveillance Systems. IEEE.
4. Viola, P., & Jones, M. (2001). Rapid Object Detection Using a Boosted Cascade. IEEE.
5. Russell, S., & Norvig, P. (2021). Artificial Intelligence: A Modern Approach. Moscow: Williams.
6. Khaykin, S. (2020). Neural Networks: A Comprehensive Course. Moscow: Dialektika.
7. Махамадов Рустам Хабибуллаевич (2022). ПЕРСПЕКТИВЫ ПРИМЕНЕНИЯ ТЕХНОЛОГИЙ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В ОБРАЗОВАНИИ. ТЕСНика, (1 (9)), 1-10.
8. Goodfellow, I., Bengio, Y., & Courville, A. (2019). Deep Learning. Cambridge, MA: MIT Press.
9. Brown, I. L., & Smirnov, A. A. (2020). Intelligent security systems. Bulletin of Information Technologies, (4), 45-52.
10. Kravtsov, N. S. (2022). Problems of personal data protection in intelligent systems. Law and the Digital Economy, (1), 60-67.
11. RX, M. Sun'iy intellekt texnologiyalari va uning ta'lim tizimlaridagi o'rni. Лучшие интеллектуальные исследования.
12. Makhamadov Rustam Khabibullayevich, & Djamatov Mustafa Khatamovich. (2025). Modern intellectual systems: status, functions, technologies and development tendencies. American Journal Of Applied Science And Technology, 5(02), 52–55. https://doi.org/10.37547/ajast/Volume05Issue02-13
13. Nilsson, N. (2019). The Quest for Artificial Intelligence. Cambridge: Cambridge University Press.