

Figure 1 – Fall action display

When testing videos, this article first tests a single person on a monotonous background, as shown in fig. 2. the algorithm in this paper can clearly identify the state of the person being detected at the time of detection under a monotonous background, and promptly mark the fall status in red before uploading.

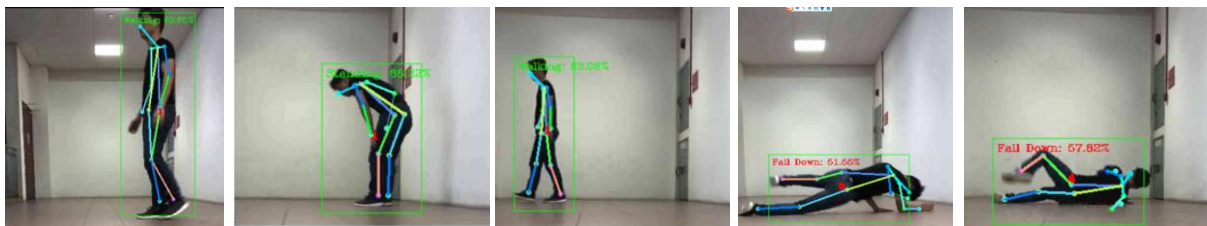


Figure 2 – Fall detection results based on video sensors

The population is aging seriously, and the number of elderly people living alone is increasing. In order to improve the behavioral safety of the elderly and basic patients when they live at home and move alone, this article proposes a fall behavior detection algorithm based on multiple sensors. This algorithm combines the optimization and acceleration of the video sensor human detection model and human posture detection model by analyzing sensor acceleration data, and uses human posture data to build a fall detection algorithm. This algorithm makes the response mechanism after a fall more efficient. At the same time, the experimental results show that the detection algorithm has high real-time performance and accuracy, and can quickly detect the fall behavior of the detected person online.

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### STUDY ON THE TREND OF DIGITAL TRANSFORMATION IN THE LOGISTICS INDUSTRY

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**Summary.** *The digital transformation of the logistics industry cannot be postponed as the scale of the digital economy grows. This paper proposes ten innovative trends based on this.*

Digital transformation is a comprehensive transformation and upgrading of processes, organizations, business models, and other aspects of the enterprise, and

the transformation process will bring the challenges of organizational change and the enhancement of personnel quality, structure, and digital capabilities [1].

In China's Outline of Vision 2035, 19 references are made to the role and positioning of logistics and modern logistics in the vision. Based on the feedback from more than 150 enterprises in China, more than 70 % of the surveyed enterprises indicated that they have already formulated digital transformation plans and started digital transformation work. However, most enterprises are in the early stages of transformation; more than 42 % of the surveyed enterprises are in the implementation stage of the digital transformation of "warehousing, transport, distribution" and other main businesses, or a single scenario, and still need a lot of resources to promote the completion of the digital transformation [2].

During the digital transformation process, enterprises combine their own digital transformation strategies, as well as actively apply cloud services, big data, unmanned equipment, and other mature digital technologies and products. Among them, cloud services play an important role in many scenarios of logistics digitization and have become an important tool to help enterprises complete digital transformation, with more than 50 % of the surveyed enterprises giving feedback on the application of different types of cloud products, such as public cloud, private cloud, and hybrid cloud.

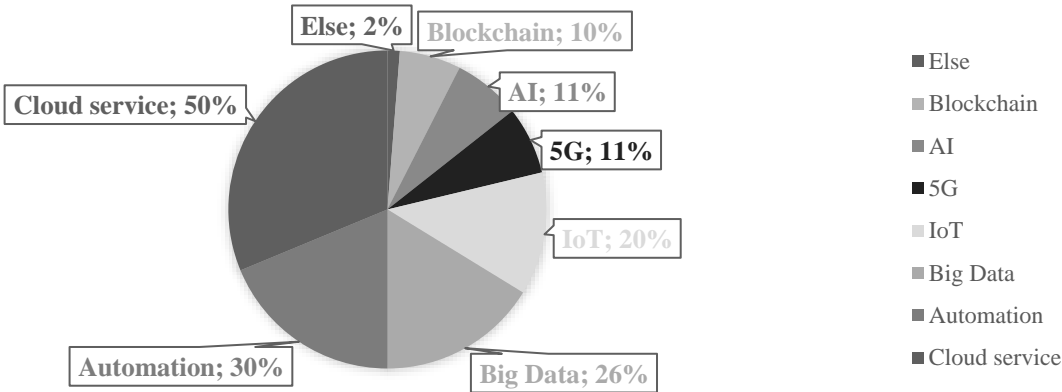


Figure 1 – Technology applications for digital transformation in the logistics industry

As advanced technology becomes more widely available, we will see a trend toward digital innovation in the logistics industry in the future.

1. Third generation identification technology represented by RFID ushers in commercial scale.
2. Unmanned technology breeds the next logistics market.
3. Hydrogen energy will transform mainline logistics.
4. Supply chain digitisation is becoming standard feature of industrial Internet.
5. XR and augmented reality make frontline workers work more efficiently.
6. LPWAN technology widely connects logistics elements.
7. Logistics technology enters the era of green packaging.
8. Logistics will become an important scenario for AI technology.

9. The whole logistics chain realizes online collaboration.
10. The automation rate of rural outlets has increased dramatically.

#### References

1. Li Yuyan. Innovative development of distribution logistics under digital transformation. Institute of Business BSU. – Minsk: 2023. – C. 438–441.
2. Li Yuyan. The construction of a logistics system under digital transformation. BSU. – Minsk: 2023. – C. 220–222.

#### УДК 004.8

#### AN IMPROVED LBP ALGORITHM IN FACE RECOGNITION

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**Summary.** *Local Binary Pattern (LBP) is an algorithm that can be effectively used for face description and has made great contributions to research in the field of face recognition. This article introduces an improved LBP algorithm.*

The main purpose of LBP is to provide a simple and effective method to capture local texture information of images. It does this by comparing the intensity values of each pixel in the image with its neighbor pixels and generating a binary code based on the comparison. LBP has the advantages of high computational efficiency, strong robustness, and invariance to rotation changes, so it has been widely used in the fields of computer vision and image processing. In subsequent research, the LBP algorithm was expanded and improved to cope with different types of tasks and application scenarios, such as facial recognition, action recognition, and scene classification. This article introduces an improved LBP algorithm for face recognition.

The traditional LBP algorithm directly calculates the center pixel value as the threshold value, which only considers the influence of the center pixel, and it is easy to obliterate the details when the center pixel value is too large or too small. Therefore, this paper proposes an improved LBP algorithm that considers the effects of both the center pixel value and the neighbor pixel value. Specifically, the method calculates the neighborhood. If  $C$  is within the limit, the center pixel value is selected as the threshold value and the LBP value is calculated, which fully considers the role of the center pixel value and the neighboring pixel value, and effectively removes the influence of the center pixel value that is too large or too small on the image feature extraction and more accurately describes the local image features; otherwise, the median value of the neighboring pixel and the center pixel is selected as the threshold value, and a comparison is made to reduce the influence of the noise points. comparison is made to reduce the influence of noise points. The specific process is as follows.