

enough wind speed for the station's stable operation and production of additional energy.

2. Wind turbines produce great noise "baffles" and vibrations, the animals and people living near the stations or working at the stations can be harmed.

3. Also, due to the great velocity of turning of the station's blades it can cause damage to birds, although such accidents are not common.

4. The cost is high and so is the length of time it takes to pay it off.

In conclusion, many of the described problems can be solved in the process of technology development. According to the International Renewable Energy Agency, despite all the cons, at the end of 2017 the capacity of wind farms was over 18.7 GW. This is almost half of the total capacity of Ukraine's energy facilities. So, the advantages of WPP definitely outweigh the disadvantages.

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A PROGRAM FOR DETECTING GEOMETRIC CHERRIES BASED ON THE ANALYSIS OF THEIR IMAGES

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Computer vision technology can rightfully be considered one of the most advanced and promising at this stage in the development of global digital computer technologies.

Computer vision (machine vision) [1] is a direction in the field of artificial intelligence, which includes algorithms for detecting, tracking and classifying objects by their images.

As examples of problems [2], in the solution of which computer vision is used, one can specify tracking and security systems, product quality control systems, recognition of objects and text documents, image search based on content, medical diagnostics, robotics, and others. Although the quality of solving the assigned tasks is incomparable with a human, but even this level is a significant progress in modern IT technologies.

Today, the number of areas in which computer vision is used is increasing every year. The agro-technological sphere has also been added to these spheres. For example, the use of computer vision technologies to calculate various geometric characteristics of certain objects by analyzing their images. Seeds, leaves, and also fruits of various plants (in particular, cherry fruits) can be used as such objects of research.

This work is devoted to the determination of the sweet cherry fruit in the photograph, and the calculation of its geometric characteristics based on the analysis of the data obtained.

As a library that implements all the functions necessary for the task, the OpenCV library was chosen - an open source computer vision library that allows both to identify objects in a photo and to determine various parameters of a specific object.

In order to determine the object in the image, it is necessary to pre-process the input photographic image, find the boundaries of the required object, calculate the necessary parameters of the object based on the obtained data, and eventually give this information to the user.

Image preprocessing is the preparation of a photograph for subsequent operations of the threshold transformation and finding the contours of the object. For a more accurate operation of computer vision algorithms, it is necessary to first remove digital noise from the image, reflections - those defects that can interfere with the recognition of an object. As such measures can be the

id	Площадь в пикселях	Реальная площадь	% от эталона (реально)	Периметр	Время	Диаметр
0	6012	1	100	306	25.10.2021 21:3...	76,5
1	61794	10,28	1027,84	1000	25.10.2021 21:3...	3,67

adjustment of the brightness of the image, changing the parameters of which, you can more clearly define the boundaries of all objects in the photo.

The next step is thresholding, that is, converting the image to a binary data type.

The conversion concept is quite simple [3]. The pixel values can be from 0 to 255. Let's say we want to convert the image to a binary image, that is, assign the pixel a value of 0 or 1. To do this, we can perform segmentation using `CvThreshold()`. If the Threshold (T) value is 125, then all

Figure 1. Example of image binarization

pixels with values greater than 125 will be assigned a value of 1, and all pixels with values less than or equal to this value will be assigned a value of 0. This will change the photo to black and white (Figure 1).

The third stage is the detection of the boundaries of the object under study. The outline of the object will be its outline.

A contour is the outer outline (outline) of an object / object.

To determine its contour in this work, the method of contour analysis is used, which makes it possible to quickly and relatively accurately calculate the contours of an object (provided that the object is located on a colorless background and there is no strong digital interference).

First, using the `CvFloodFill()` function, fill the desired contour with a different color, then



analyze the filled area through the `CvFindContours()` function and determine the boundaries of this object.

At the last stage, using the functions for calculating the area and perimeter (`CvContourArea()` and `CvContourPerimetr()`, respectively), determine the geometric characteristics of the cherry fruit, such as its diameter.

Then display the calculated information to the user on the screen in the form of a table or generate xls report (Figure 2).

Figure 2. Calculated characteristics of objects

The implemented program makes it possible to speed up the process of determining the geometric characteristics of sweet cherry fruits, in comparison with the manual calculation method, and to increase the accuracy of the final result.

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THE ‘BREAKING THE FOURTH WALL’ TECHNIQUE IN FILMMAKING

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The ‘breaking the fourth wall’ – this term migrated into filmmaking from theater. Spectators sitting in the hall see the scenery in front of them, consisting of three walls, among which all the action takes place. And the fourth one is addressed to the viewer. By the way, the term was coined in the 18th century by the French philosopher Denis Diderot. The fourth wall is present everywhere, from books and comics, to games and films, but it is presented there in different ways.

The purpose of this article is to research the principles and effects of the ‘breaking the fourth wall’ technique application. The essence of the fourth wall is to separate what is happening in a work of art from the real world. The heroes do not suspect that they are fictional, that the viewer is watching them, they do not notice the fourth wall and act as if it does not exist. Simply put, thanks to the fourth wall, the viewer or, for example, the reader, can more easily immerse themselves in the plot of the work. The purpose of breaking down this very wall is to blur this line between the story and the reality. The hero in the middle of the scene can look into the camera and begin to conduct a dialogue with the viewer, conveying any information to him. It doesn't matter what the subject will be, the contact itself is important. Sometimes just one glance is enough to convey the mood.

Let's look into the episode from the Soviet cinema production film where the character of Leonid Kuravliov urges (Figure 1) Soviet citizens to keep their money in a savings bank, if they have it, of course.

Another example is the scene from *Fight Club*, where the character of Edward Norton (Figure 2) talks through the screen about the past of the Brad Pitt's character.



Figure 1 *Ivan Vasilievich Changes Profession*, 1973, director L. Gaidai