ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 6, Issue 7 , July 2019

Developing a 3DModel Remotely Controlled Underwater Robot Cleaning the Bottom of the Reservoir from the Silver

M.M.Abdullaev, Z.A.Zayniddinova

Master student, Tashkent State Technical University, Tashkent, Uzbekistan
Candidate Technical Sciences assistant professor, Tashkent State Technical University, Tashkent, Uzbekistan

ABSTRACT: The article considers the methods of the remote-control system, which recently attracted the attention of researchers of control systems, one of the most important places is occupied by the methods of the remote-control system. Let us consider the capabilities of the remote-control system methods in order to identify their applicability in the tasks of remote control of the robot of the reservoir.

KEY WORDS: Programming, object, robot, automatic water distribution system.

I.INTRODUCTION

The primary role in the development and operation of irrigation and drainage systems at the modern level is given to the introduction of scientific and technological progress, the automation of technological processes and the system of remote control of production using electronic and microprocessor technology. Mechanization and automation of processes, including in reservoirs, is a prerequisite for the development and industrial introduction of modern tools and technologies.

In every automated system, the control object and control devices interact. The development or selection of an automatic control system begins with the study of irrigation and drainage systems as objects of automation, that is, with the study of specific features, purpose, conditions in which the process takes place. They study the degree of automation of various technological processes, as well as all the technical and economic aspects of automation.

Characteristics and classification of reservoirs. The need to create reservoirs is associated with natural and man-made causes:
-creation of a uniform distribution of river flow during the year;
-prevention (reduction) of the harmful effects of water on the environment (combating floods, mudflows, erosion of shores, etc.);
-improvement (mitigation) of the climate;
-use of water resources (hydropower; water transport; industrial, agricultural and urban water supply; fisheries value; recreation), etc.

Most of the reservoirs are created in the interests of several sectors of the economy (complex use).
Difference of reservoirs from natural waters:
- anthropogenic origin with pre-planned parameters and the possibility of regulating the hydrological regime, depending on the specific economic problems.
- radical transformation of landscapes that previously existed at the site of the reservoir, its impact on the environment, changes in the natural conditions in the adjacent territory;
- the emergence of peculiar hydrological, hydrobiological, biochemical and geological processes within reservoirs, the development of which, despite the anthropogenic origin of reservoirs, contains natural patterns;
-high dynamic processes of formation of reservoirs. It is typical for all reservoirs: an increase in depth towards the dam, except for reservoirs created on deep lakes; water exchange and flow velocity slowed down compared to a river; instability of summer thermal and gas stratification and some other features of the hydrological regime.

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 6, Issue 7 , July 2019

II. PROPOSED SYSTEM

There are reservoirs daily, weekly, seasonal (or annual) and multi-year regulation. The volume of water mass in reservoirs, the area of the mirror, the depth is subject to seasonal changes due to the uneven natural flow of water and its consumption for the needs of the country's economy. Large and small reservoirs are being created (ranging from a few tens of hectares to several thousand km2, and volumes from hundreds of thousands of m3 to hundreds of km3). In the mountainous regions of many countries, a large number of reservoirs formed by hydroelectric dams.
The existence of reservoirs is mainly associated with the regulation of water flow. During the flood there is an accumulation of river runoff - the reservoir is filled, and in the low-water period - the return of water, drawdown of the reservoir. Characteristics of the reservoir (Figure 1).

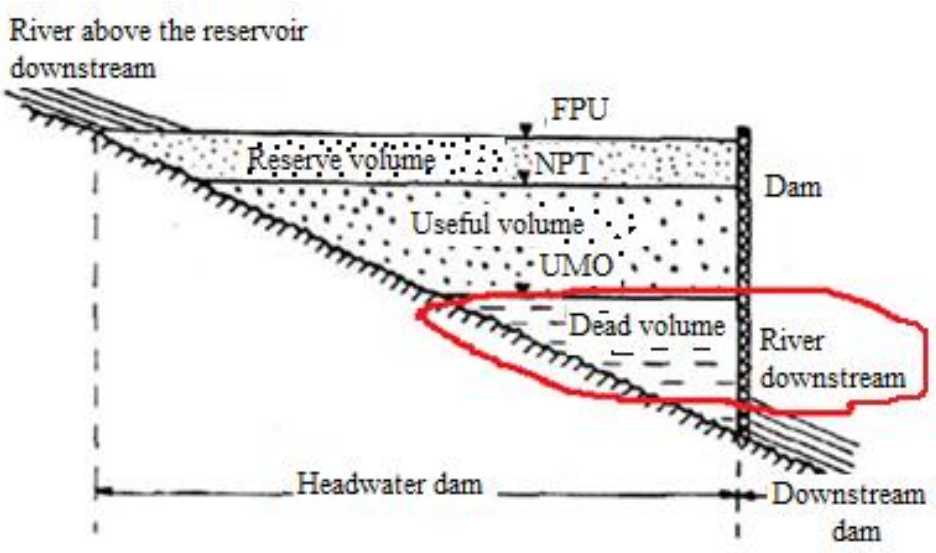

Fig. 1. The main elements of the reservoir

- the highest retaining level, which the dam can maintain for a long time while ensuring the normal operation of all facilities, is called the normal retaining level (or horizon) (NPU, or APG);
- the highest retaining level exceeding the NLU, which can be maintained for a short time during the period of the flood intake, ensuring the safety of structures, is called the forced retaining level (FPU);
- the minimum level allowed in normal operation, to which the water is processed by the reservoir during normal operation, is defined as the dead volume level (ULV);
- the useful volume of water is between NPU and ULV, the dead volume of water is below ULV. A single universal classification of reservoirs does not exist, their typification according to individual particular indicators has been proposed. According to the genesis of the reservoir are divided: - to river valleys, which are formed as a result of damming the rivers; - liquid arising in natural depressions, when excess channels of flood waters of rivers are supplied through the canals; - lake reservoirs - created by backwater and anthropogenic regulation of water exchange in natural lakes;
- underground - underground voids are used as a holding capacity; -sea coastal - areas of the sea (bays, coves, estuaries), separated from it by dams or dams. The geochemical regime of reservoirs depends on the chemical composition of the substances entering with the flow of the rivers, the nature and intensity of the intra-aquatic processes. The distribution of chemical elements in water, suspensions, sediments, living organisms is the result of biogenic, physico-chemical and mechanical migration that occurs in reservoirs.

The main factors of formation of the chemical composition of water in a regulated flow: the content of elements and their compounds in the water entering the reservoir, its location in the cascade, the degree of water exchange and hydrometeorological conditions, sedimentation, sorption and desorption processes, the interaction between water and precipitation , change in alkaline acid and redox conditions, intensity of algae development [1].

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 6, Issue 7 , July 2019

III. LITERATURE SURVEY

The Blender program is an excellent 3D editor with Russian support that can surprise any user with the size of their installation file and the amount of space occupied on their hard drive. However, this does not mean that the set of useful functions and preset textures in the editor is trimmed or limited. To increase the set of tools the user can use third-party plug-ins, both from free developers and from the official manufacturer of this software. Blender 3D also has many other advantages:
High speed of creating applications with graphical interface for MS Windows.

If desired, and with the proper skills, the user can make the necessary changes to the core of the program, because the blender program for 3D modeling is freely distributed open source software. This is what distinguishes it from other free analogues, which do not allow to interfere with the work of its own algorithm.

Installing Blender 3d editor on a computer is no different from installing any other windows program. This procedure ,as a rule, does not cause problems even for not very experienced users. However, in the first seconds after launching the 3D editor, the working interface can be very surprising. This applies even to the most experienced specialist in the field of 3D modeling. You will notice that there is nothing similar to the usual Light Wave, 3DS Max or Maya in the Blender program. You should not be frightened by the variety of bright colors of numerous icons and the lack of familiar prompts that should pop up when you hover over the object of the cursor. Acquaintance with the Blender control system is worth starting with reading a special help file.

After all, only at first glance the interface seems complicated and little understood - the whole thing is in its high interactivity. In addition to the help, in the network you can find a huge number of lessons, which will allow more detailed understanding of the wisdom of this editor. When creating a 3D model, every detail on the screen you can move to a place convenient for you and fine-tune the work of the application exactly to your work style. The main and most popular functions can be easily transferred to special buttons - hot keys, and unnecessary tools can be removed away from the eye [2].

IV. METHODOLOGY

Today, one of the most culminating problems in reservoirs is the increase in polluting suspended substances from year to year. To solve the existing problem, we propose an underwater robot that cleans the bottom of the reservoir from sludge. The development of the model of the robot is made on the Blender 3D Max program (2 fig.).

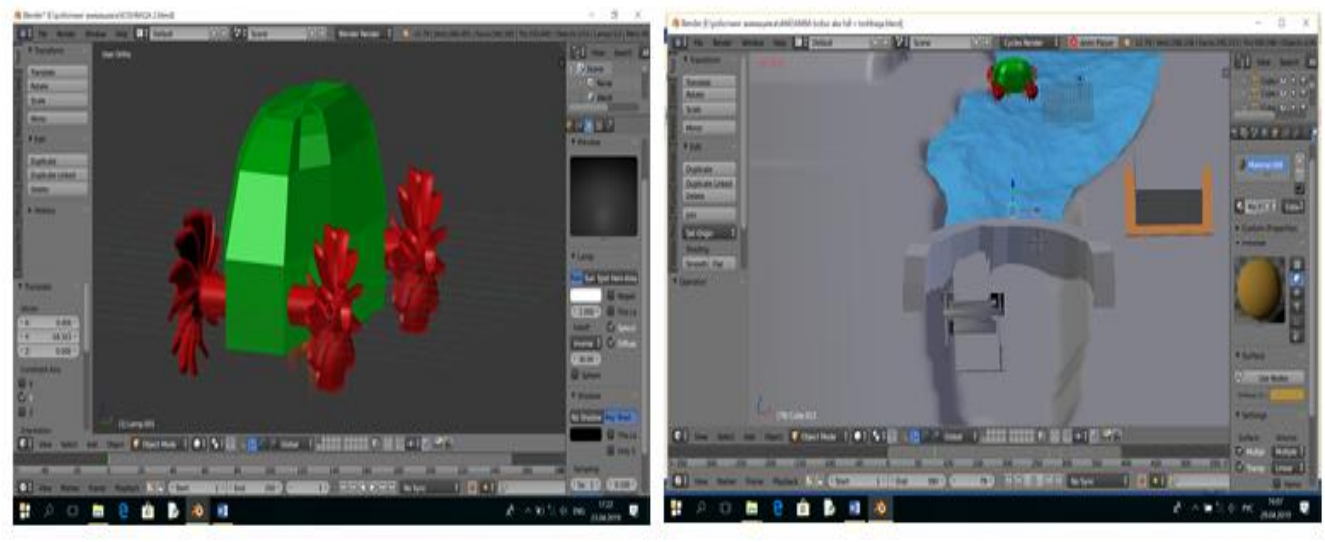

Fig 2. 3D model of the robot cleansing the bottom of the reservoir from sludge

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 6, Issue 7 , July 2019

In the developed model, you can visually see the actions of the robot, that is, cleaning the bottom of the reservoir bystirring up suspended solids, as well as learn in detail about the process of the robot (3 fig.).

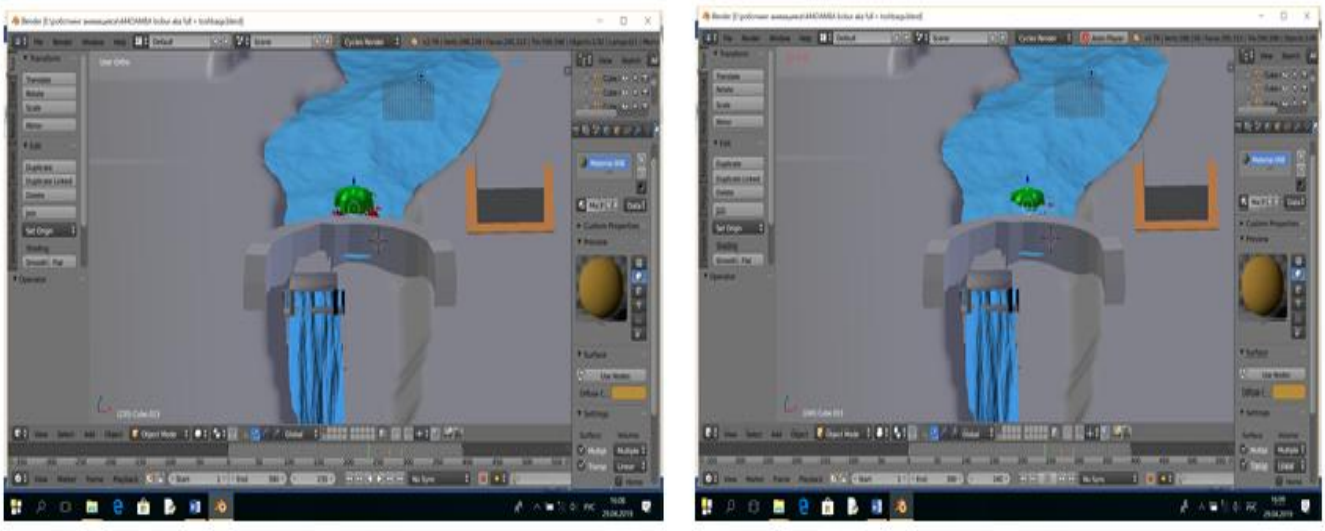

Fig 3. The robot cleans the bottom of the reservoir by stirring up suspended solids.

On the basis of the Blender 3D Max program, a system has been developed that, in real time, causes the robot to fall tothe bottom of the reservoir and stir up suspended solids(Fig4.).

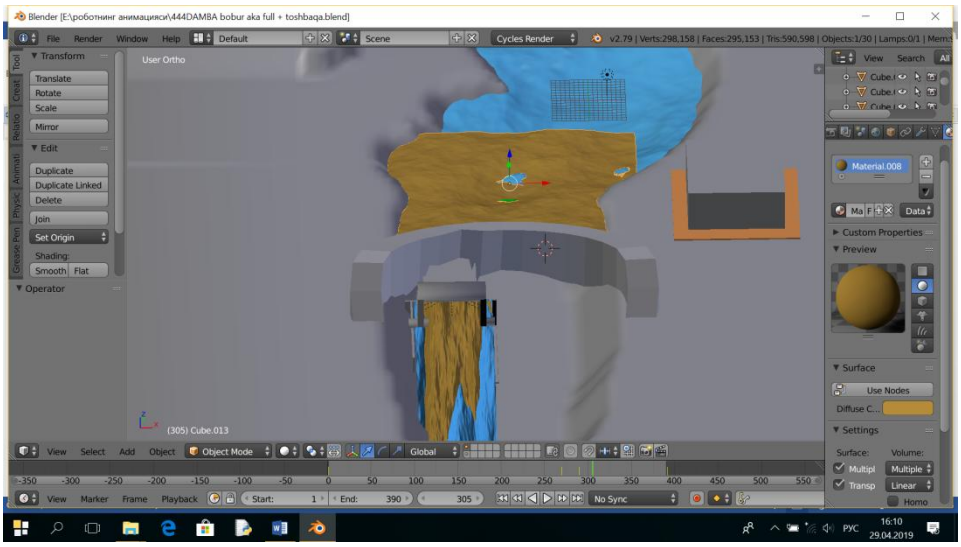

Fig 4. Based on the Blender 3D Max program, a system has been developed that, in real time, causes the robot to fall to the bottom of the reservoir and stirs suspended substances

V.CONCLUSION AND FUTURE WORK

Today, as natural resources are reduced, one of the most global problems in the world is the rational use and safe storage of water resources. In this connection, it is necessary to carry out the operation of a hydraulic structure most effectively. In the reservoirs of our republic there is a huge amount of sludge, which makes it difficult to produce the

ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 6, Issue 7 , July 2019

expected volume of water in the reservoir. Our proposed model serves to clean the bottom of the reservoir from sludge, which will result in the desired amount of water in the reservoir.

REFERENCES

[1] Goloskokov D.P. Equations of mathematical physics. Solving problems in the Maple system: textbook for higher education.-St. Petersburg: Peter,2014.
[2]Zayniddinov B.G. The use of object programming on Blender 3Dfor designing on the example of the calculationof the skinning and arrangement of stringersof the segment hydraulic shutter. - International Journal of Advanced Research in Science,Engineering and TechnologyVol. 5, Issue 6 , June 2018.