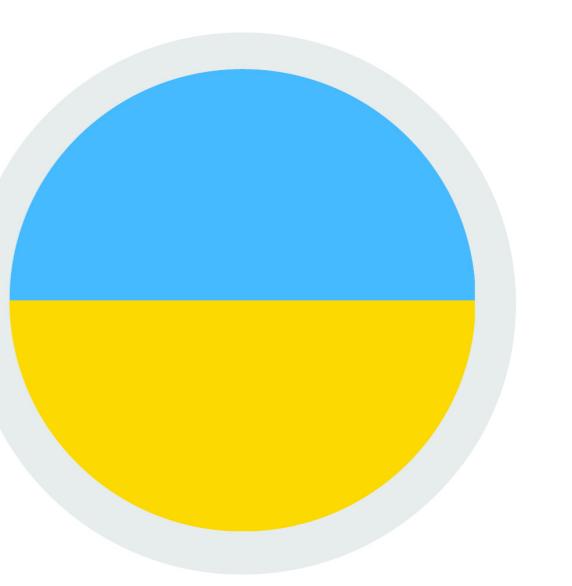


Robotic remote control assistant based on a biomechanical manipulator

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Abstract

Robotic remote control assistant based on a biomechanical manipulator — is a device created by us to improve the quality of life of older people, people with physical disabilities who are unable to move for long periods or for people who need to do work that is beyond their capabilities.

The device is able to accurately copy the movements of a person's hand remotely by using radio transmitters.

Importance

Robots and smart mechanical devices are already used in many areas of human activity: in everyday life, at the enterprises, but most of all in factories and in space. Therefore, the development of various smart mechanical devices will greatly improve the life of every person.

Goal

Create a mechanical assistant who, thanks to his design features, will be able to help people in different areas of activity. First of all, in everyday life, but, with an increase in size, at enterprises and even in space.

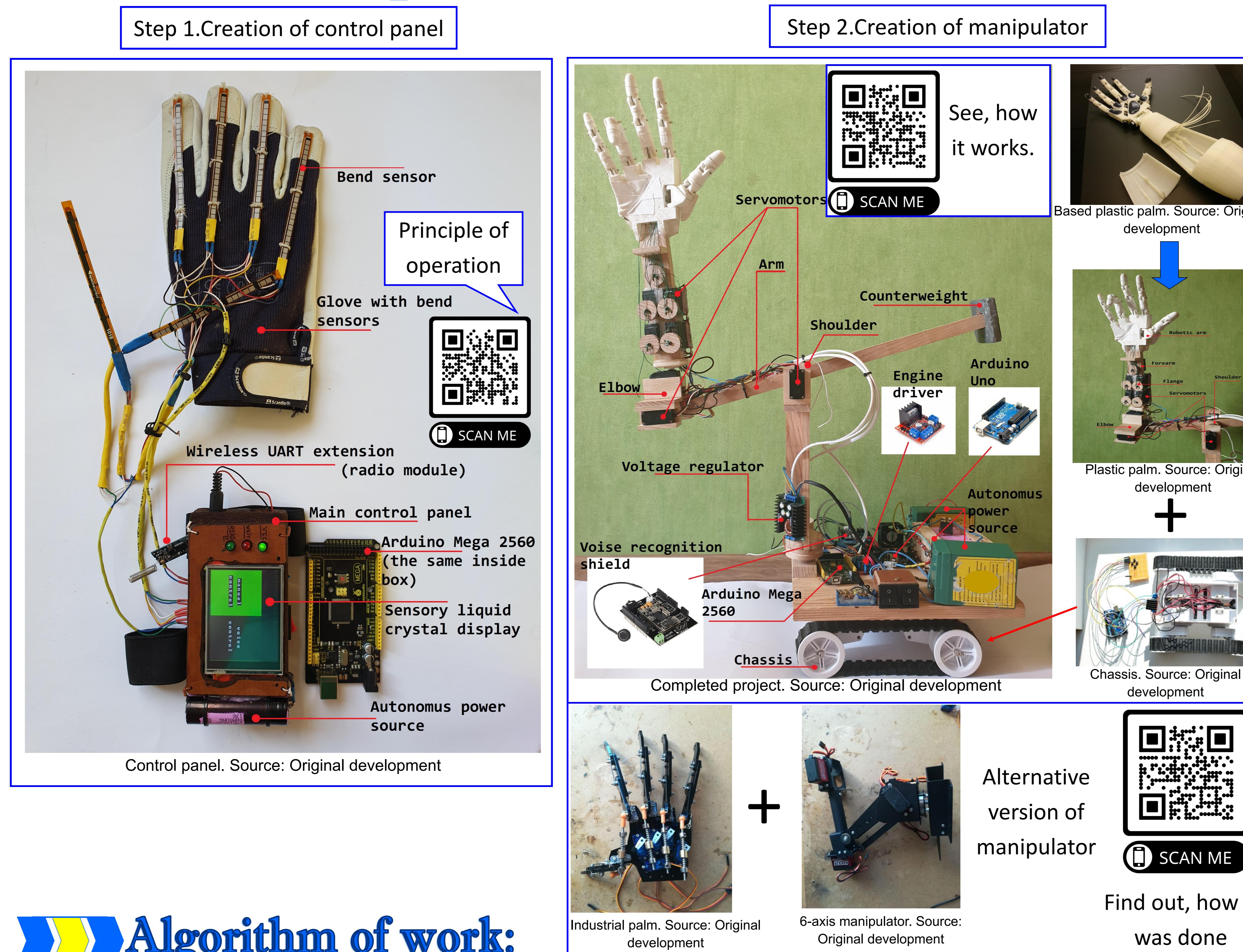
Hypothesis

Check if it is possible to create a multifunctional mechanical assistant with remote control, based on a biomechanical manipulator, at home.

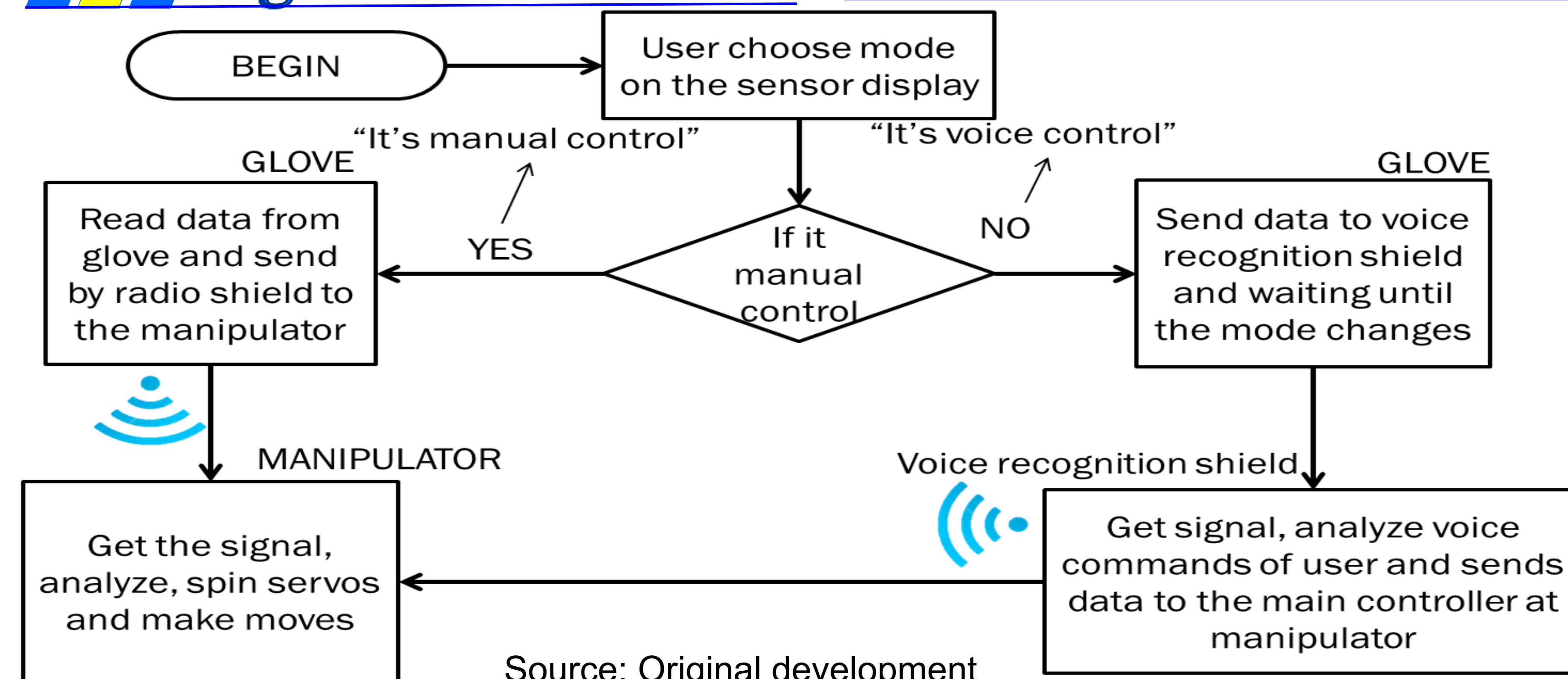
Objectives

- To study controllers and microcomputers available on the world market, based on these data to create a hardware project.
- Explore existing manipulators, and create our simpler and more functional.
- Write and optimize the program code for the device, and also carry out wireless data transmission.
- Carry out experiments on the resulting device. Find out the technical characteristics of the manipulator.

Creation process:



Algorithm of work:



Source: Original development

Results

- We managed to make a mechanical assistant based on a biomechanical manipulator controlled by Arduino controllers.
- The maximum weight that: can hold the palm — 530 g; the whole arm can lift — 315 g; the platform can carry — 1300 g.
- Given that the device is powered by 12.3.7 V / 3.3A lithium-ion batteries and 2 6V / 6A acid batteries, the estimated operating time at maximum power is 4.5 hours.
- The maximum height of the device is 97 cm (when the arm fully raised), the width is 26 cm and the length is 83 cm .

Future improvements

- Replace the existing manipulator with an alternative one made by more accurate devices;
- Install the camera, transmit video from it;
- Perform voice recognition using a phone;
- Add a new system based on the microcomputer Raspberry Pi 3, develop functions of artificial intelligence for it;
- Improve project design.

References

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