говля, дипломатия, начались междинастические браки. Всё это способствовало взаимопроникновению как культур, так и их языков. В итоге, наш лексикон обогащался, а порой заимствованные слова вытесняли даже устаревшие собственные. Уже невозможно представить себе наш язык без таких слов, как логос, метод (греч.), ярмарка (нем.), алгоритм (арабск.), юбилей (евр.), бульон (франц.) и тысяч прочих терминов из разных языков, включая имена. Таким образом, процесс заимствования слов совершенно объективный. С ним нельзя бороться, хотя можно и ограничивать, корректировать, ведь потеря собственного языка приводит к угасанию национального мировоззрения.

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ПРОБЛЕМЫ ПРОЕКТИРОВАНИЯ ОТЕЧЕСТВЕННЫХ КОНТЕЙНЕРОВОЗОВ

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In nowadays economy the world's container fleet, with the glance of new vessels construction is characterized by an excess of container capacity. This factor increases competition in the freight market. The only way to gain positions in the container transportation market is to improve existing designs and build new ships. Research is intensively conducted in this area abroad and now container ships with a capacity of 18,000 twenty-foot equivalent units (TEU − Triple-E Class) are being built already. Such ships will be constructed between 2013 and 2014. In our country there is a lack in the scientific and engineering investigations on the subject.

The design process of the ship is multi-stage, and is characterized by its complexity. Currently, however, modern computer-aided design (CAD) system helps designers; it enables to develop new vessels with high quality and in a short time. Basis for the development of technical designs are the results obtained in the early stages of research design using CAD system, which are designed to provide a multivariate research of the vessel design concept and then select an option in a contract specification or suggestions. The usage of research system allows producing optimum performance options of vessels. But it should be noted that these systems are 'proprietary' instruments and are not intended to replicate.

To compete with foreign design companies effectively, it is necessary for domestic research to develop CAD systems for various types of vessels and, above all, long-term concepts. It is especially important for container ships, because there is no domestic design experience in the past two decades. This requires, first of all, the development of the initial design methodology and the corresponding mathematical model of the design of modern container ships designed for using in CAD system vessels of this type.

БИОНИЧЕСКАЯ МЕДИЦИНА

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There are a lot of people who lose any limb and live on it. In spite of using prosthetics, these men are limited in their day-to-day life. But science brought us new branch of science – Brain Controlled Prosthetic Limbs.

The first bionic prosthetic hand has been set by scientists Rehabilitation Institute of Chicago in 2002 to electric from Tennessee, Jesse Sullivan. As an electrician, he accidentally touched an active cable that contained 7,000-7,500 volts of electricity. In May 2001, he had to have both his arms amputated at the shoulder. Seven weeks after the amputation, Jesse Sullivan received matching bionic prostheses from Dr. Todd Kuiken of the Institute. Originally, they were operated from neural signals at the amputation sites, but Jesse Sullivan developed hyper-sensitivity from his skin grafts, causing great discomfort in those areas. Jesse Sullivan underwent neural surgery to graft nerves, which originally led to his arm, to his chest. The sensors for his bionic arms have been moved to the left side of his chest to receive signals from the newly grafted nerve endings. Scientists at the Johns Hopkins University Applied Physics Laboratory (APL) were awarded no less than $34.5 million by the DARPA (Defense Advanced Research Projects Agency − the Pentagon's research division) to continue their outstanding work in the field of prosthetic limb testing.

Six years later their new Modular Prosthetic Limb (MPL) system was just about ready to be tested on human subjects, as it has proved successful with monkeys. In order for a robotic prosthetic limb to work, it must have several components to integrate it into the body's function: Biosensors detect signals from the user's nervous or muscular systems. It then relays this information to a controller located inside the device, and processes feedback from the limb and actuator (e.g., position, force) and sends it to the controller. Examples include wires that detect electrical activity on the skin, needle electrodes implanted in muscle, or solid-state electrode arrays with nerves growing through them. Mechanical sensors process aspects affecting the device (e.g., limb position, applied force, load) and relay this information to the biosensor or controller. Examples include force meters and accelerometers. The controller is connected to the user's nerve and muscular systems and the device itself. It sends intention commands from the user to the actuators of the device, and interprets feedback from the mechanical and biosensors to the user. The controller is also responsible for the monitoring and control of the movements of the device. An actuator mimics the actions of a muscle in producing force and movement. Examples include a motor that aids or replaces original muscle tissue.

The robotic arm itself weighs nine pounds, which is about as much as a real limb, and provides just as much dexterity too. Besides tasks like moving each individual finger and rotating the wrist, it is capable of 22 degrees of freedom, and reacts with speed and agility to the user's commands and can allow patients a level of freedom they never thought they'd have again. The arm allows movement in five axes and allows the arm to be programmed for a more customized feel.

Recently, robotic limbs have improved in their ability to take signals from the human brain and translate those signals into motion in the artificial limb. DARPA is working to make even more advancements in this area. Initially, the design will be used on people with spinal-cord injuries, who have lost nearly all movement and would benefit the most from using the robotic limb.

Transradial and transtibial prostheses typically cost between US $6,000 and $8,000. Transfemoral and transhumeral prosthetics cost approximately twice as much with a range of $10,000 to $15,000 and can sometimes reach costs of $35,000. The cost of an artificial limb does recur because artificial limbs are usually replaced every 3-4 years due to wear and tear. In addition, if the socket has fit issues, the socket must be replaced within several months.

The end result would be a prosthetic that acts as a veritable extension of one's own body. And a platform capable of accurately distinguishing between, and interpreting, different sensory signals − temperature, pressure, motion − would "allow the incorporation of the limb into the sense-of-self" and offer unprecedented freedom of movement for a prosthetic wear.

The agency also wants an ultra-reliable platform, with an error rate of less than 0.1 percent and a lifespan of around 70 years. By comparison, current neural-recording interfaces last around two years before they need to be replaced. Sounds far-fetched, but Darpa's already got one major lead. The agency's new Neurophotonics Research Center will investigate fiber-optic prosthetic interfaces that can incorporate thousands of sensors into a single filament.

ПРИМЕНЕНИЕ ВОЛНОВЫХ ПРЕОБРАЗОВАТЕЛЕЙ В ЭНЕРГЕТИЧЕСКОЙ ОТРАСЛИ

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World energy is recently more and more focused on new clean technologies based on renewable energy sources. One such source is the energy of the waves. In nature, this energy is presented in the most concentrated form. Wave energy has a higher compared to wind and sun energy density. Sea waves accumulate the energy of the wind over large areas of overclocking. They are, therefore, natural concentrate energy. Nowadays, there exist some types of plants, some of which are successfully used; some of them exist only "on paper". For example, in December 2005, a review was published under the title «Marine Renewable (Wave and Tidal), Opportunity Review», which deals with many kinds of tidal and wave power. In this review there were two power plants that have attracted my attention: TAPCHAN and Oyster. This review described the advantages and disadvantages of these systems.

Wave converter of TAPCHAN (OWEC) type. On the rising ground of the shore a tank is located above sea level. A tapered channel leads to the tank. The waves come in a wide part of the channel and increase in height as narrowing. Waves are swamped through the channel into the tank. Water returns to the ocean through the pipe. Water flows through the pipe of low pressure turbines of 350 kW. This power station has worked in Norway since 1985, and produces 2 million kW/h of electricity annually. There are some disadvantages:

• the application is limited by the regions where the tides are small;

• severe icing at low temperatures;

• high wave energy losses (due to friction and encounter with a partially reflected waves) during the passage through the channel walls;

• a narrow wavelength range in which the effective concentrator work is able;

• low efficiency when small short waves expose;

• a high level of capital expenditures;

• limitation of the localities where the efficiency of the apparatus is provided.

Wave converter of "Oyster" (OWSC) type. "Oyster" is the wave power station which is located on the sea coast at moderate depths of about 12 meters. Huge plate floats hinged to the base plates located on the bottom are swayed by waves and drive the two-sided piston pump. The pump drives sea water to the shore where it turns the rotor generator. The entire electrical system is placed on the coast.

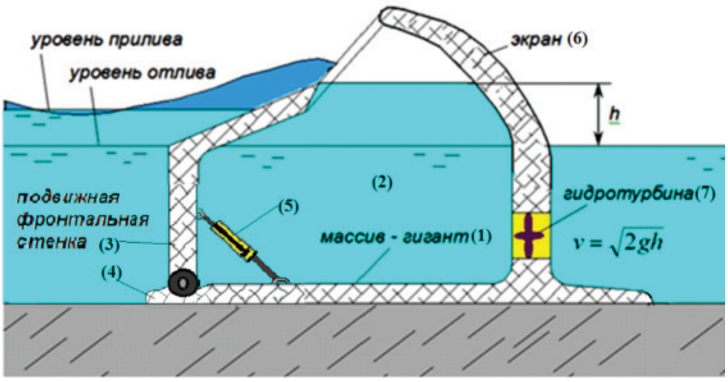
Disadvantages:

efficient usage only in large waves when there is an intense rocking of flaps;

the ability to shift and destruct installations by storm waves.

The technical result is the creation of a combined structure of the wave converter based on the systems OWSC and OWEC which eliminates their weaknesses and combine their advantages. The objective is to increase the efficiency of the converter of OWEC type by using wave energy in a wide range of height and frequency, reducing losses of wave energy on the front wall and increasing the flow rate in the channels of hydraulic turbines.

The design of the device is shown in the figure 1. Reinforced box caisson (1), forming a tank (2) attached to the bottom. The front wall (3), from the sea, is connected to base plate (4) by means of hinges. The movable front wall and base plate is connected by a linear hydraulic converter (5). In the underwater part of the back fixed wall (6) holes with hydro turbines (7) are located.



Wave converter