

## RESOLUTION

### IV International Conference “Problems of Cybernetics and Informatics”

*Baku*

*September 14, 2012*

Social and economic power of the country, its defensibility and national security, cultural and spiritual progress of the society and the welfare of the people directly (straightly) related to the scientific development level. Development of science in our country is one of the priorities of the state policy. One of the most important strategic goals of the policy realized by the President of Azerbaijan Ilham Aliyev is to turn natural resources into intellectual capacity, the development of human capital, the formation of knowledge based economy, and the creation of an information society.

Currently, the knowledge economy is one of the main priorities of the developed world. The last two decades the process of transformation of the former ideological, social and economic system into the new system lasts in Azerbaijan. During this period, important government programs, regulations and orders have been adopted, which form the basis of the knowledge economy in the country. The state program “Electronic Azerbaijan”, “National Strategy for the development of science in the Republic of Azerbaijan for 2009-2015” , implementation of which did a great job, should be particularly stressed out.

In our country, which has entered a new stage of development, the main objective of the Development Concept “Azerbaijan 2020: a vision into the future” is the collaboration with the leading countries of the world, international scientific organizations and institutions, the creation of multilateral relations, in a word, the achievement of strategic objectives. This is an essential condition to achieve durable, sustainable and innovative development. From this point of view, the IV International Conference “Problems of Cybernetics and Informatics”, during which scientific achievements have been discussed, knowledge and experience shared, international scientific relations established, is one of the activities that serve to innovative development.

The conference was attended by about 50 scientists and experts from the USA, Russia, Korea, Iran, Turkey, Georgia, Belarus, and other countries, as well as representatives of research institutions and universities of Azerbaijan dealing with the problems of Cybernetics and Informatics. Overall, the conference was presented about 250 papers that were thoroughly examined. It should be noted that the published 4volume conference proceedings are of the highest quality.

Presentations on scientific topics such as information and communication technologies, smart technologies and systems; seismic devices, systems and technology; modeling and identification; numerical methods and computer technology; applied stochastic analysis; management and optimization; decision-making in the social and economic systems were listened with great interest at the section sessions of the conference. During the sessions the trends and prospects of the development of cybernetics and informatics in the modern world, the problems existing in this field, and their solutions were discussed; recommendations were made and exchanged views. Direction “Seismic devices, systems and technology” should be noted among these trends. And it is not without reason. Earthquakes occurring during the recent years in the world highlighted the research in this direction. In addition, reports devoted to the scientific, theoretical and practical aspects of e-government and e-science, will greatly contribute to the formation of e-government and e-science in our country.

1. Final session of the **IV International Conference “Problems of Cybernetics and Informatics”** on the basis of proposals received from the sections, decides:

2. To consider the work of the IV International Conference “Problems of Cybernetics and Informatics” satisfactory. Highly assess the papers submitted by Azerbaijani and foreign scientists.
3. To express gratitude to the Presidium of ANAS, the Ministry of Communications and Information Technologies, the Ministry of Education, organizing and program committees, as well as the working group for the support in organizing the conference.
4. Technical support to the conference by the IEEE deserves special attention. Including the papers presented at the conference, into the electronic library “IEEE Xplore” is an important step in the recognition of our scientists in the world. In this regard, to strengthen cooperation with the IEEE in the future, to accelerate the integration of scientific works of Azerbaijani scientists and researchers into the leading international electronic registers (libraries), to raise the question of the recognition of the papers included into an electronic library “IEEE Xplore” by the Higher Attestation Commission under the President of the Republic of Azerbaijan.
5. To recommend the papers elected by the conference program committee for the publication in the journal “News of ANAS” and the Institute of Information Technologies of ANAS.
6. To support special resolution adopted by the section “Seismic devices, systems and technology” (attached to the resolution text).
7. To hold the next conference in 2014.

## **RESOLUTION OF SECTION “SEISMIC DEVICES, SYSTEM AND TECHNOLOGY” OF IV INTERNATIONAL CONFERENCE “PROBLEMS OF CYBERNETICS AND INFORMATICS”**

1. In real life, after a certain period of time of normal operation of construction objects in seismic regions, period of time of their latent transition into the emergency state begins due to different reasons. It is often a result of weak earthquakes, which leads to changes in their seismic stability. Subsequent weak earthquakes, hurricane winds with rain showers cause them to go into time interval of expressed emergency state.

Minimization of damage from earthquakes, due to the aforementioned reasons, requires reliable indication of the beginning of the latent period of change in seismic stability of the object, as well as the beginning of origin of anomalous seismic processes (ASP). This, in its turn, requires solving of the problem of control of microchanges in seismic stability of construction objects during frequent weak earthquakes and monitoring of ASP preceding earthquakes. Application of noise technologies is reasonable in solving of this problem.

2. Results of the experiments at the robust seismic-acoustic stations at Qum Island in the Caspian Sea carried out from 01.07.2010 to 01.05.2012, as well as in the regions of Shirvan, Siazan, Naftalan and Neftchala demonstrated that seismic-acoustic waves that arise in the beginning of origin of anomalous seismic processes do not reach the earth's surface due to frequency characteristics of certain upper strata. But our experience shows that they spread horizontally in deep strata as noise. Reaching steel pipes of the well at the depth of over 3-6 km, seismic-acoustic waves transform into acoustic signals and go to the surface at the velocity of sound, where they are detected by the hydrophone. Thereby, indication of change in estimates of noise variance, noise correlation value and other characteristics of seismic-acoustic noise allows reliable registration of the beginning of anomalous seismic processes within a radius of over 300 km, which is several tens of hours before an earthquake occurs.

3. By combining the system for control of seismic stability and systems for ASP monitoring, the general system for minimization of damage from earthquake, which allows receiving information on the coming earthquake 10 and more hours before its beginning, as well as information on the technical condition and seismic stability of socially significant construction objects. Timely decision-making on population evacuation from most vulnerable buildings, power, gas, water supply cut, reducing water level in reservoirs of hydroelectric power plants, suspension of chemical and other hazardous production, stopping subway and railroad trains can result in minimization of damage from disastrous earthquakes.

4. Taking into consideration the convincing results of the experiments, it is reasonable to integrate efforts of the scientists believing in the possibility of minimization of damage from disastrous earthquakes with application of robust noise technologies and systems. That will make it possible to carry out planned and interconnected natural experiments in many seismically active regions and joint discussion of the obtained results. It will accelerate creation and practical application of both the network of stations of ASP monitoring and systems for minimization of damage from earthquakes. In connection with the aforementioned facts, an association of scientists involved in research of minimization of damage from disastrous earthquakes with application of noise technologies and systems should be established.