Report on the work of the dissertation council
Dissertation council at IJSC " KazNRTU them. K. I. Satpayeva»
by groups of specialties 6D071200-Mechanical Engineering and 6D071600-Instrument Engineering.

The report contains the following information:

1. Data on the number of meetings held.

Seven meetings were held during the reporting period:

On September 28, 2021, a meeting of the dissertation permanent council was held on the selection and approval of the temporary dissertation composition for further evaluation of the research of the dissertation work of Gulmira Berdibaeva, a doctoral student of the Department of "RTiTSA", on the topic "Improvement of methods and means of processing speech signals based on the bionic method for voice control systems in emergency situations".

On October 6, 2021, a meeting of the dissertation permanent council was held on the selection and approval of the temporary dissertation composition selection for further evaluation of the research of the dissertation work of the doctoral student of the Department of Industrial Engineering, Mukanov Ruslan Batyrbekovich on the topic " Fabricated and combined structure development of cutter heads for holes face turning".

On October 29, 2021, a meeting of the dissertation council was held to accept documents, approve official reviewers on the dissertation work of doctoral student Berdibayeva Gulmira Kuanyshbaevna and approve the date of defense of the dissertation work on the topic: "Improvement of methods and means of processing speech signals based on the bionic method for voice control systems in emergency situations", submitted for the degree of Doctor of Philosophy PhD in the specialty 6D071600 - "Instrument Engineering".

On November 23, 2021, a meeting of the dissertation council was held to accept documents, approve official reviewers on the dissertation work of doctoral student Mukanov Ruslan and approve the date of defense of the dissertation work on the topic: "Fabricated and combined structure development of cutter heads for holes face turning", submitted for the degree of Doctor of Philosophy PhD in the specialty 6D071200 - "Mechanical Engineering".

On December 28 , 2021 , meetings of the dissertation Council for the defense of Mukanov Ruslan Batyrbekovich 's dissertation work were held on the topic: " Fabricated and combined structure development of cutter heads for holes face turning".

On December 28 , 2021 , meetings of the dissertation council for the defense of Berdibaeva Gulmira Kuanyshbaevna 's dissertation work were held on the topic: " Improvement of methods and means of processing speech signals based on the bionic method for voice control systems in emergency situations".

On December 28, 2021, a meeting of the dissertation council was held on the selection and approval of the temporary dissertation composition selection for further evaluation of the research of the dissertation work on the acceptance of documents, approval of official reviewers on the dissertation works of doctoral student Mustafa Azamat Koishykululy on the topic "Research on parallel manipulators of the RoboMech class" in the specialty 6D071200 - Mechanical Engineering.

2. There are no names of council members who attended less than half of the meetings.

3. List of doctoral students indicating the organization of training.

№	Full name of the doctoral student	Organization of training
1	Begaliev Kanatbek (6D071600-Instrument engineering)	Satbayev University
2	Kalmenov Ermukhamed (6D071600-Instrument engineering)	Satbayev University
3	Musaev Magzhan (6D071600-Instrument engineering)	Satbayev University

4	Nurmagambet Sayan Doszhanuly (6D071600-Instrument engineering)	Satbayev University
5	Sarybai Madina (6D071600-Instrument engineering)	Satbayev University
6	Fazylova Alina (6D071600-Instrument engineering)	Satbayev University

4. A brief analysis of the dissertations reviewed by the council during the reporting year, with the following sections highlighted:

4.1 Analysis of the subject of the reviewed works.

4.1.1. Analysis of the work of Ruslan Batyrbekovich Mukanov:

Dissertation topic "Fabricated and combined structure development of cutter heads for holes face turning" in 6D071200 – "Mechanical Engineering".

The dissertation was completed at Satbayev University.

The defense language is Russian.

Scientific consultants:

– Asylbek Zhumabekovich Kasenov, candidate of technical sciences, professor at Toraighyrov University, Pavlodar, Kazakhstan.

– Alexandr Sergeyevich Yanushkin, docotr of technical sciences, professor at Chuvash State University named after I.N. Ulyanov, Cheboksary, Russia.

The defense took place on December 28th, 2021.

Designs of new metal-cutting tools – fabricated and combined cutter heads – have been developed: by the creation of favorable conditions in the cutting process by balancing the moments arising during cutting that positively affect the accuracy and quality of hole processing. A diagram of the process of machining holes with a fabricated cutter head was completed. This made possible to describe the cutting conditions; mechanism of action and distribution of cutting forces. The calculation of the assembled cutter head using the APM Multiphysics software was made, also its balancing was determined, which leads to the equality of moments, uniform rotation during processing, a decrease in vibrations and vibrations, and, consequently, a decrease in error, an increase in processing accuracy and a decrease in the roughness of the hole surface. The developed design of a new metal-cutting tool, a combined cutter head with hard-alloy inserts, was tested in plant conditions.

4.1.2. Analysis of the work of Berdibayeva Gulmira Kuanyshbaevna:

Dissertation topic «Improvement of methods and means of processing speech signals based on the bionic method for voice control systems in emergency situations» specialty 6D071600 - "Instrument engineering".

The dissertation was completed at Satbayev University.

The defense language is Kazakh.

Scientific consultants:

Ozhikenov Kassymbek Adilbekovich-Candidate of Technical Sciences, Professor of Satbayev University.

Bodin Oleg Nikolaevich, Doctor of Technical Sciences, Penza State University.

The defense took place on December 28, 2021.

For the first time, an approach to the construction of a dual-purpose voice control system based on the bionic method in a complex signal-interference environment is proposed, which makes it possible to more reliably recognize the control commands of robotic mechanisms. A new speech recognition algorithm has been developed, which differs duplication in the formation of a speech command and providing a more reliable functioning of the voice control system (at least 99%) compared to known algorithms. A new method of zoning of the territorial technosphere according to the criterion of public health risk has been developed, characterized by the use of:

- heterogeneous group of unmanned aircraft to identify factors of negative impact on the objects of the territorial technosphere under normal conditions and minimize the consequences in emergency situations;

-geoinformation system for creating a dynamic map of the territorial technosphere and visual representation of the ecological situation on it. A new technique for preprocessing speech commands has been developed, characterized by an improved algorithm for filtering non-stationary background noise based on the Hilbert-Huang transform and analysis of noise and energy characteristics of empirical modes to determine the mode containing the basic tone. The structure of the LSTM neural network and the technique of neural network analysis of speech commands have been adapted, which, according to the results of an experimental study of a speech command, ensure the reliability of speech command recognition by 5% higher than that of known methods of speech signal analysis. The structure of a dual-purpose voice control system based on the bionic method is proposed and justified, which implements new methods of analyzing speech signals and provides reliable (at least 99%) recognition of speech commands in a complex signal-interference environment.

4.2. Connection of dissertation topics with national state programs, as well as targeted Republican and regional scientific and technical programs.

4.2.1. Thesis of doctoral student R.B. Mukanov in 6D071200 – "Mechanical Engineering" themed "Fabricated and combined structure development of cutter heads for holes face turning" took place as a part of utilizing funds of scholarships "Design and development of fabricated and combined cutter heads" in scopes of "Zhas Ghalym" program for 2015–2016 (order № 6/1-07/625 dated 01.11.2013) and young scientists for 2021–2023 годы as a part of ИРН AP09058231 project " Research and design of resource- and energy-saving metal-cutting tools", funded by Science Committee of Ministry of Education and Science of the Republic of Kazakhstan

4.3. Analysis of the level of implementation of the results of dissertations in practice.

4.3.1. The results of the dissertation work are introduced into the production of Pavlodar Pipe-Rolling Plant LLP, as well as the educational process of Toraighyrov University (formerly known as Pavlodar State University named after S. Toraighyrov) for the subject "Design and production of metal-cutting tools" which is a part of "Mechanical Engineering" study program.

4.3.2. Dissertation work of PhD candidate in the specialty 6D071600 - "Instrument engineering" Berdibaeva G.K., on the topic of «Improvement of methods and means of processing speech signals based on the bionic method for voice control systems in emergency situations», scientific results obtained during the development of voice control systems are used in the educational process of the Department "Robotics and automation equipment" Satbayev University, as well as in the production process and design and research work in LLP "MedRemZavod Holding".

4.3.2.1. Patent RU 2,694,528 C1. Search and rescue operations are being carried out. Berdibaeva G. K. Sherstnev V. V., Bodin O. N. Bezborodova O. E., Ozhikenov K. A., Published: 16.07.2019, Byul. No. 20.

4.3.2.2. Patent RU 2,759,310 C1. The bionic control system of robotic devices is also capable. Bezborodova O. E. Berdibaeva G. K., Bodin O. N., Ozhikenov K. A. Sherstnev V. Published: 11.11.2021, Byul. No. 32.

4.3.2.3. Patent RU 2 762052 C1. An unmanned aircraft was used to carry out rescue operations. Sherstnev V. V. Bezborodova O. E., Belik D.S., Bodin O.N. Spirkin A. N. Berdibaeva G. K. Published: 15.12.2021, Byul. No. 35.

5. Analysis of the work of official reviewers (with examples of the most low-quality reviews) - no.

6. There are no proposals for further improvement of the system of training scientific personnel.

7. Number of dissertations for the degree of doctor of philosophy(PhD), doctor by profile in the context of specialties (areas of training):

1) 3 dissertations accepted for defense including doctoral students from other Universities-no;;

2) no dissertations withdrawn from consideration (including doctoral students from other Universities);

3) there are no dissertations that received negative reviews from reviewers (including doctoral students from other Universities);

4) there is no dissertation with a negative decision based on the results of the defense (including doctoral students from other Universities).

Chairman of the dissertation council _____ Ozhikenov A.K.
Academic Secretary of the dissertation council _____ Baktybayev M.K.

Print date "__5__" __January___ 2022 year