Approved by the decision
of the MIPT Academic Council
dated May 26, 2022
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Federal State Autonomous Educational Institution of Higher Education "Moscow Institute of Physics and Technology (National Research University)"

THE MAIN EDUCATIONAL PROGRAM OF HIGHER EDUCATION

Level of higher education
MASTER

Domain of study
01.04.02 APPLIED MATHEMATICS AND INFORMATICS

Orientation (specialty)
MODERN STATE OF ARTIFICIAL INTELLIGENCE/СОВРЕМЕННЫЕ МЕТОДЫ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

Starting year of the educational program
2022 y.

The main educational program of higher education in the field domain of study 01.04.02 Applied Mathematics and Informatics, orientation (specialty) Modern State of Artificial Intelligence/Современные методы искусственного интеллекта, implemented at MIPT, is a set of basic characteristics of education (volume, content, planned results), organizational and pedagogical conditions, forms of certification, which is presented as a general characteristic of the educational program, curriculum, academic calendar schedule, work programs of disciplines (modules), training programs, evaluation and methodological materials. The main educational program of higher education has been created on the basis of the educational standard domain of study 01.04.02 Applied Mathematics and Informatics, independently developed and approved by MIPT.

1. General characteristics of the educational program

Qualifications awarded to graduate: master.

Form of education: full-time

Education period: 2 years.

The educational program consists of: 120 credits and includes all types of student's classroom and independent work, training, time, allotted for quality control of the mastering of the educational program by the student.

The contact work of students with teachers consists of, at least, 1 161 hours.

Program implementation language: english.

Using a network form of educational program implementation: no.

Program goal:

The program is focused on training highly qualified specialists in the field of artificial intelligence, the purpose of which is for graduates to gain comprehensive knowledge in the field of machine and deep learning, as well as the ability to correctly apply their methods. Graduates of the program will gain competencies in the field of distributed and cloud computing, will gain the ability to draw useful conclusions from data analysis and present them in an informative form, and graduates will also gain the skill to create stable and productive software, as well as reliable and stable data transmission lines, a general idea of the current state and trends in the development of AI. The program focuses on the practical experience of students to work on AI applications, on real cases from companies and examples from scientific projects, interactive educational process. The program includes e-courses, weekly webinars and consultations with a teacher, individual guidance for scientific work.

2. Characteristics of the professional activity of graduates:

Fields of professional activity and areas of professional activity,

in which graduates, who have mastered the master's program, can carry out professional activities:

06 Communications, information and communications technologies (in the field of engineering, development, modernization of computer hardware and information systems).

Graduates can carry out professional activities in other fields of professional activity and (or) areas of professional activity, provided that their level of education and acquired competencies meet the requirements of the employee's qualification.

Types of tasks of professional activity of graduates:

research.

Tasks of professional activity of graduates:

application of fundamental knowledge gained in the field of mathematical and (or) natural sciences to the creation of new computer models, technologies and algorithms;

preparation of scientific and technical reports, reviews, publications based on the results of research.

Objects of professional activity of graduates, mastered the program Master's:

software for computer hardware and automated systems (programs, software packages and systems).

3. List of professional standard, corresponding to the professional activities of graduates:

06.003 Software architect;

06.028 System programmer.

Code and name of the professional standard	Generalized labor functions			Labor functions		
	code	name	level of qualification	name	code	level of qualification
06.003 Professional standard "Software architect"	H	Assessment of the possibility of creating an architectural project	6	Evaluation of the possibility of creating an architectural design of a software tool	H/01.6	6
				Defining software tool architecture goals	H/02.6	6
				Identification of key scenarios for software tool architecture	H/03.6	6
	I	Approval and control of methods and ways of interaction of a software tool with its environment	6	Technical study of possible options for the architecture of components, including a description of the options and a feasibility study for the selected option	I/02.6	6
				Choosing a model for ensuring the required level of component performance, including load balancing issues	I/03.6	6
				Choice of technologies and software development tools, including source code management systems	I/05.6	6
	K	Modernization of the software tool and its environment	6	Development of software product upgrade plans	K/01.6	6
				Changing the environment of the software product	K/02.6	6
06.028 Professional standard "System programmer"	C	Development of operating systems	7	Formation of requirements for operating system	C/01.7	7
				Development of operating system architecture	C/02.7	7
				Control of architecture compliance in the process of writing an operating system	C/04.7	7

				Debugging operating system components under development	C/05.7	7
				Maintenance of the created operating system	C/07.7	7
	D	Organization of system software development	7	Formation of a group of programmers for the development of system software	D/02.7	7
				Organization of the work of programmers in the system software development group	D/03.7	7
				Supervising the activities of the programmers working group for the development of system software	D/04.7	7

4. Requirements for the results of mastering the educational program

As a result of mastering the main educational program, the graduate should form universal, general professional and professional competencies.

Universal competencies of graduates and indicators of their achievement:

Code and name of competence	Code and name of the indicator of competence achievement
UC-1 Use a systematic approach to critically analyze a problem, and develop an action plan	UC-1.1 Systematically analyze the problem situation, identify its components and the relations between them UC-1.2 Search for solutions by using available sources UC-1.3 Develop a step-by-step strategy for achieving a goal, foresee the result of each step, evaluate the overall impact on the planned activity and its participants
UC-2 Able to manage a project through all stages of its life cycle	UC-2.1 Set an objective within a defined scientific problem; formulate the agenda, relevance, significance (scientific, practical, methodological or other depending on the project type), forecast the expected results and possible areas of their application UC-2.2 Forecast the project outcomes, plan necessary steps to achieve the outcomes, chart the project schedule and monitoring plan UC-2.3 Organize and coordinate the work of project stakeholders, provide the team with necessary resources UC-2.4 Publicly present the project results (or results of its stages) via reports, articles, presentations at scientific conferences, seminars, and similar events
UC-3 Able to organise and lead a team, developing a team strategy to achieve a goal	UC-3.1 Organize and coordinate the work of the project stakeholders and help resolve disputes and conflicts UC-3.2 Consider the interests, specific behavior, and diversity of opinions of team members/colleagues/counterparties UC-3.3 Foresee the results (consequences) of both individual and collective actions UC-3.4 Plan teamwork, distribute tasks to team members, hold discussions of different ideas and opinions

UC-4 Use modern communication tools in the academic and professional field, including those in a foreign language	UC-4.1 Exchange business information in oral and written forms in Russian and at least one foreign language UC-4.2 Use the acquired skills to write, translate, and edit various academic texts (abstracts, essays, reviews, articles, etc.) UC-4.3 Present the results of academic and professional activities at various academic events, including international conferences UC-4.4 Use modern ICT tools for academic and professional collaboration
UC-5 Analyze and consider cultural diversity in intercultural interactions	UC-5.1 Identify specific philosophical and scientific traditions in major world cultures UC-5.2 Define the theoretical and practical significance of cultural and linguistic factors within various interrelated philosophical and scientific traditions
UC-6 Determine priorities and ways to improve performance through self-assessment	UC-6.1 Achieve personal growth and professional development, determine priorities and ways to improve performance UC-6.2 Evaluate performance results in correlation with the set objectives and applied methods

General professional competencies of graduates and indicators of their achievement:

Code and name of competence	Code and name of the indicator of competence achievement
Gen.Pro.C-1 Address current challenges in fundamental and applied mathematics	Gen.Pro.C-1.1 Apply fundamental scientific knowledge, new scientific principles, and research methods in applied mathematics and computer science Gen.Pro.C-1.2 Consolidate and critically assess professional experience and research findings Gen.Pro.C-1.3 Understand interdisciplinary relations in applied mathematics and computer science and apply them in professional tasks
Gen.Pro.C-2 Iimprove upon and implement new mathematical methods in applied problem solving	Gen.Pro.C-2.1 Assess the current state of mathematical research within professional settings Gen.Pro.C-2.2 Assess the relevance and practical importance of applied mathematical research in professional settings Gen.Pro.C-2.3 Understand professional terminology used in modern scientific and technical literature and present scientific results in oral and written form
Gen.Pro.C-3 Develop mathematical models and conduct their analysis in the processes of professional problem-solving	Gen.Pro.C-3.1 Analyze problems, plan research strategy to achieve solution(s), propose, and combine solution approaches Gen.Pro.C-3.2 Employ research methods to solve new problems, and apply knowledge from various science and technology fields Gen.Pro.C-3.3 Gain knowledge of analytical and computational methods of problem-solving, understand the limitations for applying the obtained solutions Gen.Pro.C-3.4 Gather, expand, and apply mathematical knowledge to solve non-standard problems, including problems in a new, unfamiliar environment or interdisciplinary context
Gen.Pro.C-4 Combine and adapt current information and communications technologies (ICTs) to meet professional challenges	Gen.Pro.C-4.1 Use ICTs to search and analyze professional information, highlight, structure, format, and present it in the form of analytical reviews with sound conclusions and recommendations Gen.Pro.C-4.2 Apply ICTs to solve the task in hand, to draw conclusions, and to evaluate the obtained results Gen.Pro.C-4.3 Create original algorithms and use software tools and modern smart technologies for professional problem-solving
Gen.Pro.C-5 An understanding of current scientific and technical problems in the field of informatics and computer technology, and is able to formulate professional tasks in scientific language	Gen.Pro.C-5.1 An understanding of the current state of research within his/her professional thematic area Gen.Pro.C-5.2 Able to assess the relevance of research in informatics and computer technology and its practical relevance Gen.Pro.C-5.3 A good command of the professional terminology used in modern scientific and technical literature, and is able to present the results of scientific work orally and in writing as part of professional communication

Gen.Pro.C-6 Capable of selecting and/or developing approaches to solving typical and new problems in informatics and computer technology, taking into account the characteristics and limitations of different solution methods	Gen.Pro.C-6.1 Able to analyse the problem, plan the solution, suggest and combine ways of solving it Gen.Pro.C-6.2 Capable of developing and upgrading software and hardware for information and automated systems Gen.Pro.C-6.3 Able to use research methods to solve new problems by applying knowledge from different fields of science (technology) Gen.Pro.C-6.4 Proficient in analytical and computational solution methods, and understands and takes into account in practice the limits of applicability of the solutions obtained Gen.Pro.C-6.5 Able to independently acquire, develop and apply mathematical, natural science, socio-economic and professional knowledge to solve non-standard problems, including in new or unfamiliar environments and in an interdisciplinary context

Professional competencies of graduates and indicators of their achievement:

Code and name of competence	Code and name of the indicator of competence achievement	Basis (professional standarts, analysis of other requirements for graduates)
type of professional activity tasks: research		
Pro.C-1 Become part of a professional community and conduct local research under scientific guidance using methods specific to a particular professional setting	Pro.C-1.1 Apply principles of scientific work, methods of data collection and analysis, ways of argumentation; prepare scientific reviews, publications, abstracts, and bibliographies on research topics in Russian and English Pro.C-1.2 Understand the verification process of software models used to solve related scientific problems Pro.C-1.3 Use practical knowledge of scientific argumentation when analyzing a research subject area	System programmer
Pro.C-2 Understands and is able to apply modern mathematical apparatus and algorithms, the basic laws of natural science, modern programming languages and software; operating systems and networking technologies in research and applied activities	Pro.C-2.1 Demonstrate expert knowledge of research basics in the field of ICTs, philosophy and methodology of science, scientific research methods, and apply skills to use them Pro.C-2.2 Demonstrate practical experience of applying methods and digital signal processing algorithms, using the Internet, abstracting, referencing, searching for bibliographic sources, and working with scientific sources Pro.C-2.3 Use fundamental knowledge in the field of information theory to carry out research tasks	Software architect
Pro.C-3 Participate in scholarly discussions, make speeches and presentations (oral, written, and online) on scientific topics, present research materials, proofread, edit, reference scientific works	Pro.C-3.1 Learn the basics of scholarly discussion and the forms of verbal scientific communication Pro.C-3.2 Hold an appropriate discussion of ICTs and information systems, ask and answer questions related to a particular scientific subject Pro.C-3.3 Participate in student science conferences, hold discussions on IT topics in various formats (face-to-face, online, by correspondence)	System programmer

5. Curriculum

The curriculum (Appendix 1) determines the list, labor input, sequence and distribution by periods of study of academic disciplines (modules), trainings, other types of educational activities, forms of intermediate and final certification of students. The labor input of the educational program is set in credit units.

The volume of compulsory part, excluding the volume of the state final attestation, is 60,83 persents percent of the total volume of the program.

The matrix of compliance of competencies with the disciplines of the curriculum is given in Appendix 2.

6. Academic calendar schedule

Academic calendar schedule (Appendix 3) shows the distribution of types of educational activities, periods of attestation of students and vacations by year of study (courses) and within each academic year. The academic calendar schedule of the educational program of higher education includes 92 4/6 weeks, of which there are 58 5/6 weeks of theoretical and practical training, 15 3/6 weeks of the credit-examination period, 3 1/6weeks of the state final certification and 15 1/6 weeks of holidays.

7. Work programs of disciplines (modules)

Work programs of disciplines (modules), including evaluation materials for ongoing monitoring of progress and intermediate certification, are presented in Appendix 4.

8. Practice programs

The educational program provides for the following trainings:

Personal Research Project/Научно-исследовательская работа: practical training.

Work programs of trainings, including assessment materials for ongoing monitoring of progress and intermediate certification are presented in Appendix 5.

9. Program of the state final certification

As part of the state final certification, the following are provided:

Performance of and Defence of Graduation Thesis/Выполнение и защита выпускной квалификационной работы.

The program of the state final certification (Appendix 6) includes requirements for final qualifying works (volume, structure, design, presentation), the procedure for their implementation, the procedure for defending the final qualifying work, criteria for evaluating the results.

10. Material and technical, educational and methodological support of the educational program

Work programs of disciplines (modules), trainings determine the material and technical, educational and methodological support of the educational program, including a list of licensed and freely distributed software, a list of electronic educational publications and (or) printed publications, electronic educational resources, a list and composition of modern professional databases and information reference systems.

Classrooms for conducting learning sessions provided for by the educational program feature equipment and technical teaching aids, the composition of which is determined in the work programs of disciplines (modules) and trainings.

Premises for independent work of students are equipped with computers with Internet connection and are provided with access to the electronic information and educational environment of MIPT.

The MIPT electronic information and educational environment provides access to:

- Electronic library system (hereinafter – ELS):

Golden Fund of Scientific Classics ELS
University Online Library;
Book on Lime of University's Book House publishing house;
Doe publishing house ELS;
Urait publishing house ELS;
IBooks.ru publishing house ELS;
Information system "National Electronic Library" (NEL);
LLC Publishing House Fizmatkniga;
Znanium ELS;
books.mipt.ru ELS;

Litsenziat ELS;
Knowledge Lab ELS;
- international scientific journals and electronic databases:
ELS Doe Database
SPIE journals;
The Cambridge Crystallographic Data Centre Database;
Elsevier database;
Web of Science database;
abstract and scientometric database (citation index) Scopus;
American Chemical Society journals;
American Institute of Physics journals;
Optical Society of America database;
The Royal Society of Chemistry journals;
Sage Publications journals;
Taylor & Francis Group journals;
WILEY journals;
American Physical Society journals;
Cambridge University Press publishing house journals;
Institute of Electrical and Electronics Engineers database;
Institute of Physics journals;
MathSciNet abstract database;
Oxford University Press journals;
American Association for the Advancement of Science — AAAS journal;
Springer Nature E-Books database;
Questel patents database;
Annual Reviews journals.

Material, technical and methodological support of the educational program is carried out on the material and technical base of the MIPT Department of Machine Learning and Digital Humanities. Internships are held on the basis of the Machine Intelligence Laboratory and other MIPT research laboratories.

11.Features of the educational program implementation for the disabled and persons with special needs

If there are persons with disabilities or persons with special needs among students, the educational program is adapted taking into account the special educational needs of such students.
When teaching according to an individual curriculum for people with disabilities, the period for mastering the educational program can be extended at their request by no more than one year compared to the period for obtaining education for the corresponding form of education.

12. Staff conditions for the implementation of the educational program

The implementation of the basic educational program is provided by managers and scientific and pedagogical workers who have a basic education corresponding to the profile of the discipline taught, and an academic degree or experience in the relevant professional field and are systematically engaged in scientific and (or) scientific and methodological activities in accordance with the requirements of the MIPT standard 01.04.02 Applied Mathematics and Computer Science. The courses are taught in English by highly qualified teachers and recognized experts in the field. The program is implemented with the support of the NTI Competence Center on the basis of MIPT in the direction of "Artificial Intelligence"

The share of scientific and pedagogical staff (in teaching loads reduced to integer values) with an education corresponding to the profile of the discipline (module) being taught, in the total number of scientific and pedagogical staff implementing the Master's program is more than 70 persents.

The share of scientific and pedagogical staff (in teaching loads reduced to integer values) who have an academic degree (including an academic degree awarded abroad and recognized in the Russian Federation) and (or) an academic title (including an academic title obtained abroad and recognized in the Russian Federation), in the total number of scientific and pedagogical staff implementing the Master's program, is more than 60 persents.

The share of scientific and pedagogical staff (in teaching loads reduced to integer values) from the number of managers and employees whose activities are related to the orientation (specialty) of the ongoing Master's program (having work experience in this professional field for more than 3 years) in the total number of employees implementing the master's program is more than 5 persents.

The general management of the scientific content of the master's program is carried out by the Doctor of Physics and Mathematical Sciences, Vorontsov Konstantin Vyacheslavovich, who carries out independent research projects and participates in the implementation of such projects in the field of study, who has annual publications based on the results of this research activity in leading Russian and international peer-reviewed scientific journals and publications, as well as carrying out annual approbation of the results of this research activity at national and international conferences.

Vorontsov Konstantin Vyacheslavovich — Professor of the Department of Intelligent Systems of the Phystech School of Applied Mathematics and Computer Science, Head of the Department of Machine Learning and Digital Humanities, Doctor of Physical and Mathematical Sciences, Associate Professor of the Department of Mathematical Forecasting Methods of the Faculty of the Moscow State University, lecturer at the Yandex School of Data Analysis, Professor at the HSE. In 2016, he received the honorary academic title of Professor of the Russian Academy of Sciences.

He was awarded a medal of the Russian Academy of Sciences with a prize for young scientists for winning a competition dedicated to the 275th anniversary of the Russian Academy of Sciences, for his joint work with E. V. Naryzhny "Expert and algebraic methods for constructing artificial intelligence systems" (1999). He is a member of the Council on Science and Technology under the State Duma Committee on Science and High-Tech Technologies.

Education

2010 - Doctor of Physico-Mathematical Sciences: A.A. Dorodnitsyn Computing Center of the Russian Academy of Sciences, specialty 05.13.17 "Theoretical foundations of Computer Science", dissertation topic: Combinatorial theory of reliability of learning by precedent

1994 - Specialty: Moscow Institute of Physics and Technology, specialty "engineer-mathematician". He entered the graduate school of the VC RAS

1988 - Graduated from school No. 59 (now No. 1286) and entered MIPT

Qualification works

1994 - Thesis "Preliminary data processing for solving recognition problems in liquid chromatography".

1995 - Abstract on philosophy "Intuition in mathematics". An attempt to understand the secrets of thinking of major mathematicians.

1999 - PhD thesis "Local bases in an algebraic approach to the recognition problem". Abstract.

1999 - Medal of the Russian Academy of Sciences with a prize for young scientists in the competition dedicated to the 275th anniversary of the Russian Academy of Sciences, for joint work with E. V. Naryzhny "Expert and algebraic methods for constructing artificial intelligence systems".

2010 - Doctoral dissertation "Combinatorial theory of the reliability of precedent-based learning". Abstract.

Professional experience

1988 - Graduated from School No. 59 (now No. 1286) and entered MIPT

1993-1997 - ICT Software Engineer ICTC of the Ministry of Health of the Russian Federation (Information and Advisory Toxicological Center of the Ministry of Health of the Russian Federation).

1994 - Graduated from MIPT and entered the graduate school of the VC RAS.

1997-2001 - Expert of the Moscow Interbank Currency Exchange. Development and maintenance of SMARTS and SAFRAN exchange analytical systems. Solving data analysis problems: assessing the influence of individual bidders on pricing, non-standard technical analysis, tariff optimization, etc.

2001 - Researcher, Senior Researcher at the VC RAS. Project management for grants of the Russian Foundation for Basic Research and the Russian Academy of Sciences.
2001 - Deputy Scientific Director of Forexis.
2004 - Associate Professor, Deputy Head (until 2013), Professor (since 2013) of the Department of Intelligent Systems of the FUPM MIPT.
2007 - Associate Professor of the Department of Mathematical Methods of Forecasting at the Moscow State University.
2008 - Teacher of the Yandex School of Data Analysis at the SADE teaches the course "Machine Learning".
One of the leading Russian specialists in the field of data analysis. Author of the course "Introduction to Machine Learning" on Coursera. One of the creators and site administrators MachineLearning.ru . Research interests are related to text analysis, information retrieval, probabilistic thematic modeling, transactional data analysis, biomedical data analysis, electrocardiogram disease diagnosis.
2010 - Expert of the Yandex Development Department.
2011 - Professor at the Higher School of Economics.
Professional interests
Everything that is hidden behind the terms "data science" (datascience), "data mining" (datamining) and "machine learning" (machinelearning): pattern recognition, forecasting, mathematical statistics, discrete mathematics, numerical optimization methods, big data analytics, as well as practical data analysis in various fields (medicine, technology, bioinformatics, economics, linguistics, internet).(MSU, MIPT).
2010 - Seminar Data Analysis Tasks in Business Analytics (MSU).
2013 - Semester course Probabilistic thematic models (MSU, MIPT).
Publications over the last 5 years:
1 Ianina A., Vorontsov K. Hierarchical Interpretable Topical Embeddings for Exploratory Search and Real-Time Document Tracking. International Journal of Embedded and Real-Time Communication Systems (IJERTCS) Vol.11, Issue 4, 2020 19p.
2 Irkhin I. A., Bulatov V. G., Vorontsov K. V. Additive regularization of topic models with fast text vectorization // Computer Research and Modeling, 2020, 12(6), Pp.1515-1528 (Irkhin I. A., Bulatov V. G., Vorontsov K. V. Additive regularization of thematic models with fast text vectorization // Computer research and modeling, Vol.12, No. 6, 2020 pp.1515-1528).
3 Vorontsov K. V. Ten open problems of probabilistic thematic modeling // Intellectualization of information processing (IOI-2020): Abstracts of the dokl. — Moscow: RAS, 2020 P.208-210.
4 Ishkina S. K., Vorontsov K. V. Sharpness Estimation of Combinatorial Generalization Ability Bounds for Threshold Decision Rules // Automation and Remote Control, 2021, 82(5), Pp.863-876 (Ishkina Sh. Kh., Vorontsov K. V. Investigation of overestimation of retraining estimates of threshold decision rules // Automation and Telemechanics, No. 5, 2021 C. 151-168).
5 Alekseev V., Egorov E., Vorontsov K., Goncharov A., Nurumov K., Buldybayev T. TopicBank: Collection of coherent topics using multiple model training with their further use for topic model validation // Data and Knowledge Engineering, 2021 V.135, 101921
6 Vorontsov K. V. Tasks and methods of understanding natural language for monitoring media space // Mathematical methods of pattern recognition, abstracts. - Moscow: Russian Academy of Sciences, 2021 pp.362-367.
7 Gerasimenko N. A., Chernyavsky A. S., Nikiforova M. A., Nikitin M. D., Vorontsov K. V. Incremental thematic models with additive regularization for highlighting trending scientific topics // Mathematical methods of pattern recognition, abstracts of reports. — Moscow: Russian Academy of Sciences, 2021 p.344-349.
8 Ramazanova A., Yanina A. O., Vorontsov K. V. Neural thematic models for recommending articles // Mathematical methods of pattern recognition, abstracts of reports Moscow, Russian Academy of Sciences, 2021, pp.350-355.
9 Serdyuk Yu. A., Vorontsov K. V. Implementation of an EM algorithm for additively regularized

thematic models on GPU // Mathematical methods of pattern recognition,
abstracts. — Moscow: Russian Academy of Sciences, 2021 p.356-361.
10 Alekseev V. A., Vorontsov K. V. Topic Bank: collection of interpreted topics using
multiple training of thematic models and their further use for assessing
the quality of thematic models // Mathematical methods of pattern recognition,
abstracts. — Moscow: Russian Academy of Sciences, 2021 pp.313-318.
11 Khrylchenko K. Ya., Vorontsov K. V. Optimi

13. Information about the departments involved in the implementation of the educational program

Chair of Machine Learning and Digital Humanities : laboratory Manager, Doctor of Physics and Mathematical Sciences, Vorontsov Konstantin Vyacheslavovich, leading researcher-Head of the laboratory. Development and implementation of competitive products based on artificial intelligence technologies using the existing reserves and competencies of MIPT and partners; Creation of a new research and development infrastructure based on MIPT, including hardware and software, collective use centers in the field of artificial intelligence; Development of a training system capable of solving complex scientific and engineering tasks in the field of creating, introduction and application of artificial intelligence technologies.