Innopolis University aspires for the status of a leading university for training personnel for the development of the Russian digital economy. In 2018 we took a number of very significant steps.

Our university won a grant from the National Technological Initiative (NTI). Center for Technologies of Components of Robotics and Mechatronics was opened. The new center brings together leading players within the framework of the created consortium, which helps to consolidate our country’s experience in the field of robotics and bring it to a new level.

We created an affiliated company Innogeotech, which has developed and launched a pilot project of a cloud 4D-geoinformation platform on the territory of the Republic of Tatarstan within the framework of the National Technology Initiative’s Aeronet roadmap plan. And we are ready to scale the obtained results.

Our Information Security Center won the Russian Foundation for Basic Research (RFBR) grant for the development of an early warning system of a computer attack on critical infrastructure of enterprises of the Republic of Tatarstan based on the creation and development of new NBIC technologies of cybersecurity.

We continue to develop a network of industrial partners. In 2008, several giants joined Innopolis network such as Russian Railways, Gazpromneft, Sibur, X5 Retail Group, Transneft, NTI University 20.35.
"Innopolis University aspires for the status of a leading university for training personnel for the development of Russian digital economy."
Our figures of:

639 students in the 2018-2019 academic year
2017: 556  2014: 50
2016: 635  2013: 14
2015: 322

11 scientific laboratories
2017: 13  2014: 4
2016: 13  2013: —
2015: 11

6 development centers
2017: 7   2014: —
2016: 3   2013: —
2015: —

150 graduates
2016: 28   2013: —
2015: 17

Industrial partners

Academic partners
1155,53
amount of grants and projects won (million rubles)
2017: 1 213,1  2014: 416,3
2016: 167,4    2013: —
2015: 35,5

651,3
amount of sponsorship funds (million rubles)
2017: 690,8  2014: 211,0
2016: 336,9  2013: 462,6
2015: 535,9

110
scientific publications (Scopus)
2017: 96     2014: 12
2016: 113    2013: 1
2015: 78

13
grants and projects
2017: 9     2014: 3
2016: 10    2013: —
2015: 16

Number of staff involved in

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching</td>
<td>1</td>
<td>6</td>
<td>26</td>
<td>32</td>
<td>36</td>
<td>50</td>
</tr>
<tr>
<td>Scientific activities</td>
<td>—</td>
<td>14</td>
<td>44</td>
<td>38</td>
<td>65</td>
<td>115</td>
</tr>
<tr>
<td>Project and grant activities</td>
<td>—</td>
<td>—</td>
<td>10</td>
<td>25</td>
<td>66</td>
<td>147</td>
</tr>
<tr>
<td>Pre-university education</td>
<td>3</td>
<td>26</td>
<td>47</td>
<td>37</td>
<td>42</td>
<td>44</td>
</tr>
<tr>
<td>Administrative process</td>
<td>29</td>
<td>42</td>
<td>92</td>
<td>115</td>
<td>123</td>
<td>131</td>
</tr>
<tr>
<td>— higher education</td>
<td>10</td>
<td>17</td>
<td>35</td>
<td>36</td>
<td>41</td>
<td>43</td>
</tr>
<tr>
<td>— general support</td>
<td>19</td>
<td>25</td>
<td>57</td>
<td>75</td>
<td>77</td>
<td>79</td>
</tr>
<tr>
<td>— extended learning</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>88</td>
<td>219</td>
<td>247</td>
<td>332</td>
<td>487</td>
</tr>
</tbody>
</table>
## Income

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance at the beginning of the year</td>
<td>30,076,361 rubles</td>
</tr>
<tr>
<td>Project and research activities</td>
<td>725,545,796 rubles</td>
</tr>
<tr>
<td>Educational services</td>
<td>246,705,555 rubles</td>
</tr>
<tr>
<td>Affiliate contributions and donations</td>
<td>651,388,886 rubles</td>
</tr>
<tr>
<td>Other</td>
<td>105,223,578 rubles</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,506,828,814 rubles</strong></td>
</tr>
</tbody>
</table>
## Expenditures

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount (rubles)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>420,952,566</td>
</tr>
<tr>
<td>Scientific activities</td>
<td>406,102,766</td>
</tr>
<tr>
<td>Pre-university training</td>
<td>57,068,465</td>
</tr>
<tr>
<td>University Management</td>
<td>284,584,122</td>
</tr>
<tr>
<td>Events</td>
<td>39,861,034</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,208,568,953</strong></td>
</tr>
<tr>
<td><strong>Balance at the end of the year</strong></td>
<td><strong>328,336,222</strong></td>
</tr>
</tbody>
</table>
New students

11 640
application in the 2018–2019 academic year

Russia: 6 342
Abroad: 3 875
CIS countries: 1 423

Master’s degree programs: 5 729
Bachelor’s degree program: 5 437
Postgraduate program: 474

13
selections
Basic full-time for the citizens of the Russian Federation and CIS in bachelor’s and master’s degree: 7
For masters only: 5
For bachelors only: 1

197
interviews with candidates from far abroad countries

Bachelor’s degree program: 94
Data Science: 28
Robotics: 28
Software project management: 25
System and Network Engineering: 22

8
Open days
for 695 entrants

9
CIS countries
Kazakhstan: 727 applications
Uzbekistan: 249 applications
Kyrgyzstan: 175 applications
Belarus: 102 applications
Tajikistan: 84 applications
Turkmenistan: 32 applications
Azerbaijan: 23 applications
Moldova: 20 applications
Armenia: 11 applications
### CIS countries

- Africa: 43
- Asia: 33
- America: 21
- Europe: 19
- Oceania: 4

### Asia: 1,496 applications

<table>
<thead>
<tr>
<th>Country</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan</td>
<td>591</td>
</tr>
<tr>
<td>Indonesia</td>
<td>256</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>145</td>
</tr>
<tr>
<td>India</td>
<td>95</td>
</tr>
<tr>
<td>Syria</td>
<td>48</td>
</tr>
<tr>
<td>Iraq</td>
<td>44</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>38</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>36</td>
</tr>
<tr>
<td>Yemen</td>
<td>27</td>
</tr>
<tr>
<td>Nepal</td>
<td>23</td>
</tr>
<tr>
<td>Jordan</td>
<td>21</td>
</tr>
<tr>
<td>Vietnam</td>
<td>17</td>
</tr>
<tr>
<td>China</td>
<td>16</td>
</tr>
<tr>
<td>Malaysia</td>
<td>15</td>
</tr>
<tr>
<td>Iran</td>
<td>15</td>
</tr>
<tr>
<td>Lebanon</td>
<td>13</td>
</tr>
<tr>
<td>Myanmar</td>
<td>11</td>
</tr>
<tr>
<td>Republic of Korea</td>
<td>9</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>9</td>
</tr>
<tr>
<td>OAE</td>
<td>9</td>
</tr>
<tr>
<td>Palestine</td>
<td>8</td>
</tr>
<tr>
<td>Cambodia</td>
<td>7</td>
</tr>
<tr>
<td>Philippines</td>
<td>7</td>
</tr>
<tr>
<td>Qatar</td>
<td>7</td>
</tr>
<tr>
<td>Thailand</td>
<td>7</td>
</tr>
<tr>
<td>Kuwait</td>
<td>5</td>
</tr>
<tr>
<td>Mongolia</td>
<td>4</td>
</tr>
<tr>
<td>Taiwan</td>
<td>4</td>
</tr>
<tr>
<td>Singapore</td>
<td>3</td>
</tr>
<tr>
<td>Japan</td>
<td>3</td>
</tr>
<tr>
<td>Israel</td>
<td>3</td>
</tr>
<tr>
<td>Laos</td>
<td>1</td>
</tr>
<tr>
<td>Oman</td>
<td>1</td>
</tr>
</tbody>
</table>

### Africa: 1,865 applications

<table>
<thead>
<tr>
<th>Country</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egypt</td>
<td>768</td>
</tr>
<tr>
<td>Nigeria</td>
<td>302</td>
</tr>
<tr>
<td>Ghana</td>
<td>135</td>
</tr>
<tr>
<td>Algeria</td>
<td>69</td>
</tr>
<tr>
<td>Libya</td>
<td>62</td>
</tr>
<tr>
<td>Rwanda</td>
<td>56</td>
</tr>
<tr>
<td>Cameroon</td>
<td>42</td>
</tr>
<tr>
<td>Kenya</td>
<td>42</td>
</tr>
<tr>
<td>Tunisia</td>
<td>42</td>
</tr>
<tr>
<td>Uganda</td>
<td>36</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>32</td>
</tr>
<tr>
<td>Sudan</td>
<td>30</td>
</tr>
<tr>
<td>Morocco</td>
<td>25</td>
</tr>
<tr>
<td>Guinea</td>
<td>21</td>
</tr>
<tr>
<td>Tanzania</td>
<td>19</td>
</tr>
<tr>
<td>Angola</td>
<td>17</td>
</tr>
<tr>
<td>South Africa</td>
<td>16</td>
</tr>
<tr>
<td>Gambia</td>
<td>13</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>13</td>
</tr>
<tr>
<td>Sierra</td>
<td>13</td>
</tr>
<tr>
<td>Leone</td>
<td>12</td>
</tr>
<tr>
<td>Botswana</td>
<td>12</td>
</tr>
<tr>
<td>Senegal</td>
<td>11</td>
</tr>
<tr>
<td>Republic of the Congo</td>
<td>9</td>
</tr>
<tr>
<td>Malawi</td>
<td>8</td>
</tr>
<tr>
<td>Somalia</td>
<td>7</td>
</tr>
<tr>
<td>Burundi</td>
<td>5</td>
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<tr>
<td>Côte d'Ivoire</td>
<td>5</td>
</tr>
<tr>
<td>Niger</td>
<td>5</td>
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</tbody>
</table>

### Europe: 257 applications

<table>
<thead>
<tr>
<th>Country</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukraine</td>
<td>137</td>
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<tr>
<td>Turkey</td>
<td>38</td>
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<tr>
<td>Germany</td>
<td>17</td>
</tr>
<tr>
<td>Italy</td>
<td>15</td>
</tr>
<tr>
<td>Spain</td>
<td>9</td>
</tr>
<tr>
<td>Georgia</td>
<td>8</td>
</tr>
<tr>
<td>Albania</td>
<td>5</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>5</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>3</td>
</tr>
<tr>
<td>Hungary</td>
<td>3</td>
</tr>
<tr>
<td>Macedonia</td>
<td>3</td>
</tr>
<tr>
<td>Romania</td>
<td>3</td>
</tr>
<tr>
<td>Serbia</td>
<td>3</td>
</tr>
<tr>
<td>France</td>
<td>3</td>
</tr>
<tr>
<td>Great Britain</td>
<td>1</td>
</tr>
<tr>
<td>Latvia</td>
<td>1</td>
</tr>
<tr>
<td>Norway</td>
<td>1</td>
</tr>
<tr>
<td>Slovakia</td>
<td>1</td>
</tr>
<tr>
<td>Montenegro</td>
<td>1</td>
</tr>
</tbody>
</table>

### America: 251 applications

- El Salvador: 89
- Colombia: 23
- Mexico: 23
- USA: 23
- Haiti: 20
- Bolivia: 17
- Peru: 13
- Brazil: 11

### Oceania: 6 applications

- Australia: 3
- New Zealand: 1
- Palau: 1
- Fiji: 1
Students of the academic year 2018 / 2019

639
students of the 2018–2019 academic year
Bachelors: 476
Masters: 141
Postgraduate students: 22

254
accepted students in the 2018–2019 academic year
Bachelors: 154
Masters: 100

Distribution of students by program:

90.4
The average test score of the Unified State Exam of the first year students
According to this indicator, Innopolis University took 2nd place among technical universities, 1st place among extra-budgetary universities and 7th place among all universities in the rating of admission quality according to joint monitoring of Higher School of Economics, Rosobrnadzor and the Ministry of Higher Education and Science of the Russian Federation.

3 years
average experience of students enrolled in Master’s program

15 years
maximum experience of students enrolled in Master’s programme
175 38 79 33

**Russian students:**
- Bachelors: 110
- Masters: 65

**Subjects of the Russian Federation:**

**Foreign students:**
- Bachelors: 44
- Masters: 35

**Countries:**
- Abroad: 27
- CIS: 6

**Russian students:**
- Tatarstan: 67
- Moscow and Moscow region: 13
- Other regions: 85

**Foreign students:**
- Asia: 33%
- Europe: 8%
- America: 7%
- Africa: 9%
The Board of Trustees

Nikolay Nikiforov
2012 — 2018 — Minister of Communications and Mass Media of the Russian Federation, Chairman of the Board of Trustees

Roman Shaikhutdinov
Deputy Prime Minister of the Republic of Tatarstan — Minister of Information and Communications of the Republic of Tatarstan

Sergey Belousov
Founder and CEO of Acronis, Founder of Runa Capital and Qwave Fund
Mark Shmulevich
Main strategic and operating director of Acronis

Alexander Tormasov
Rector of Innopolis University, Professor, Doctor of Physical and Mathematical Sciences

Anton Sushkevich
Co-founder of Postgres Professional, co-founder of NVision Group

Dmitry Kondratiev
Founder and Chairman of the Board of Directors of the Network of Educational Centers for Schoolchildren “Unium”
Working with the industry

144 Industrial partners

13 new partners

[Logos of partners]
6 research centres

- Robotics technology components and mechatronics
- Civil Aviation
- Cyber Security
- Business Processes Automation
- Blockchain System
- Geo Information System
Center of robotics technology components and mechatronics

June 6, 2018
Opening of the National Center of NTI Competences in Robotics and Mechatronics at Innopolis University

Aleksandr Klimchik
Head of the Center

The Center is engaged in:
- development of industrial and collaborative robotics;
- creation of new robotic solutions for medicine and rehabilitation, home, agriculture;
- development of humanoid and many-legged walking robots, unmanned aerial and land transport.

Center:
Laboratory of industrial robotics
Laboratory of autonomous transport systems
Mechatronics, control and prototyping laboratory
Support and Development Department
Department of Educational and Olympiad Activity Organization
**Center Consortium**

**Russian universities**
- National Research University of Electronic Technology (MIET)
- Moscow Institute of Physics and Technology
- Far Eastern Federal University
- ITMO University
- National Research University “Higher School of Economics”
- Lobachevsky State University of Nizhny Novgorod — National Research University (UNN)
- Peter the Great St. Petersburg Polytechnic University
- Tambov State University named after G. R. Derzhavin
- National Research Tomsk State University
- Don State Technical University
- Volgograd State Technical University
- Ufa State Petroleum Technological University
- Izhevsk State Technical University named after M.T.Kalashnikov
- Skolkovo Institute of Science and Technology

**Foreign universities**
- IMT Atlantique
- Shenzhen Institutes of Advanced Technology
- Aalborg University
- Umeå University
- Lund University
- Ruhr-Universität Bochum
- Norges teknisk-naturvitenskapelige universitet - NTNU

**Research institutes**
- Udmurt state University
- Research Institute of multiprocessor computing and control systems
- Institute of Automation and Control Processes of the Far East Branch of the Russian Academy of Sciences
- Mechanical Engineering Research Institute Research Institute of the Russian Academy of Sciences
- Institute for Information Transmission Problems (Kharkevich Institute)

**Industrial companies**
- LLC Fanuk
- PJSC KAMAZ
- PJSC Sberbank of Russia
- Joint Engineering Center (GAZ Group)
- PJSC Rostelecom
- PJSC Aeroflot
- JSC NGO Androidnaya Technica
- LLC Aurora Robotics
- LLC Copter Express Technologies
- LLC STC “Arkodim”
- LLC URTC Alfa-Intech
- LLC Eidos-robotics
- LLC Rozum Robotics
- LLC Walter Integration
- LLC Vector Group
- LLC Finco
Tasks of the center

Building infrastructure for breakthrough development and research in robotics

Creation of educational programs and training of highly qualified specialists

Development of new science-intensive products and services in robotics for the benefit of partners
Focus areas

**Industrial robotics**
- metrology and calibration;
- manipulation and motion planning;
- collaborative robotics;
- development of robotic cells and their components.

**Control, mechatronics and prototyping**
- humanoid robots and promoters;
- dynamics and control systems;
- executive mechanisms and systems;
- modeling and design of complex robotic systems;
- perception, manipulation and remote control;
- mechatronics, sensorics and sensation;
- additive technologies and prototyping of robotic systems.

**Self-contained vehicles**
- autonomous ground vehicles;
- unmanned aerial vehicles;
- underwater and surface robots;
- homogeneous and heterogeneous group interaction of unmanned vehicles.

**Single purpose robotics**
- mobile robotics;
- service robotics;
- agricultural robotics;
- cognitive and social robotics.

For business

**Commercial projects**
Implementation of commercial projects in the interests of Russian and foreign companies in the field of industrial robotics, mechatronics, autonomous transport and other areas of robotics.

**Own developments**
Execution of orders using own developments, including a service model or with the sale of licenses.

**Consultations**
Technical advice and expertise in the field of mechanics and control of mechanical systems.

**Startups**
Assistance in the creation of robotic start-ups.

Partners of the Center

- [Image of logos]
Center projects

In 2018 the Center held the International Summer School on Collaborative Robotics and Programming for graduates, postgraduates and young researchers.

The Center runs a weekly Robotics Club, a collaborative space for the experts of industrial companies, research centers and the employees of the center. In 2018, the Club held 14 meetings.

- Development of a modular system for remote and commercial vehicles autonomous control in conjunction with the aerial prospecting complex based on domestic components
  
  **The Client:** Federal Target Program Industrial Partner: “KAMAZ”  
  **Year of completion of the project:** 2019

- Development of software and hardware complex to ensure movement on smooth and rough terrain of anthropomorphic robotic complexes with variable stiffness drives
  
  **The Client:** Federal Target Program Industrial Partner: “Android technology”  
  **Year of completion of the project:** 2019

- Creation of commercial urban transport with intelligent driver assistance system City Pilot
  
  **The Client:** Federal Target Program Industrial Partner: “KAMAZ”  
  **Year of completion of the project:** 2020

- Development of methods for identification of models of interaction of robot with adaptive supply with human and environment
  
  **The Client:** Russian Science Foundation  
  **Year of Project Completion:** 2019

- Monitoring of methane and carbon dioxide concentrations in the environment near industrial sites and pipelines by means of multi-rotor drones
  
  **The Client:** National Technology Initiative Industrial partner: “LED Microsensor NT”  
  **Year of completion of the project:** 2019

- Development of modeling methods of robotic systems with mechanical compliance and shortage/overage of controlling actions, position control algorithms and system elastic properties
  
  **The Client:** Russian Foundation for Basic Research  
  **Year of completion of the project:** 2020
22 scientific papers were published in journals and conference proceedings, including those of the most influential conference in the field of Robotics, ICRA2018, and IEEE International Conference on Robotics and Automation.

Intelligent methods of creation and improvement of primitives of motion for anthropomorphic robots

*The Client: Russian Foundation for Basic Research*
Year of completion of the project: 2020

Development of a stiffness model and methods of compensation for malleability errors for walking anthropomorphic platforms

*The Client: Russian Foundation for Basic Research*
Year of completion of the project: 2020

Development of methods of design of airship control systems, unified to their technical characteristics and design of the actuators

*Grant of the President of the Russian Federation*
Year of completion of the project: 2018

Development of methods of modeling and control of reconfigurable rope robots taking into account the elastic deformations of mechanical elements

*Industrial partner: “Arcodim”*

Creation of a milling complex based on the industrial FANUC robotic arm

*Industrial partner: Fanuc*

National Technology Competition “Winter track”

*Industrial partner: KIA Motors RUS*

Roadmap of robotization of production processes in LLC “PC “NEVZ”

*Industrial partner: “2050”*
Achievements of the centers

Information Security Center

Developments:

- new models and methods of ensuring cyber stability of the digital economy of the Russian Federation to unknown cyber attacks;
- prototypes of cyber stability in the conditions of transition to the sixth technological paradigm and technology of Industry 4.0. Including software and hardware complex of early detection of computer attack on critical information infrastructure of the Russian Federation.

Grant:

The Information Security Center has won the Russian Foundation for Basic Research (RFBR) grant for the development of an early warning system on a computer attack on critical infrastructure of enterprises of the Republic of Tatarstan based on the creation and development of new NBIC technologies of cybersecurity.

The Center received 4 licenses from the Federal Service for Technical and Export Control of Russia:

- for the technical protection of confidential information;
- for the development and production of information security tools;
- for carrying out works related to the development of means of protection information;
- for implementation of measures and/or provision of services in the field of protection of state secrets (in terms of technical protection of information).

Specialists of the center performed training for employees of 5 companies

For the first time, a program of professional retraining of employees of state and local government bodies of the Republic of Tatarstan has been prepared in the field of Cyber security.
Training programs “Information security of digital economy of the Russian Federation”

- Digital transformation in the direction of “Information security” of the state program “Digital economy”;
- Compliance with the requirements of FZ-187 “On the security of critical information infrastructure of the Russian Federation”;
- Organizational and technical measures for the protection of confidential information;
- The cyber stability of the digital enterprise;
- Information security of corporate solutions based on big data collection and processing technologies;
- Methodology of development of secure enterprise applications based on Agile and data protection standards ISO/IEC 27034-1, 15408-3, 12207 and GOST P 56939;
- Business Continuity Management (BCM).

Letters of gratitude

From the United Nations Office for Cybercrime to work in a group of international experts on training modules on cybercrime

From the Embassy of Bulgaria in Moscow and the NGO “Council of Bolgar Postgraduates in Russia” (SBAR) for participation in the scientific and technical conference

From the organizers of the forum The International Business Congress (IBC) for the examination of grants of young researchers and scientists
Head of the center Sergey Petrenko wrote 2 books:

**Big Data Technologies for Monitoring of Computer Security: A Case Study of the Russian Federation**

The book elaborates on the practical application of Big Data to address cybersecurity issues. Published by Springer Science + Business Media, the second largest publishing house in the world in the field of “STM” (science, technology, medicine).

**Cyber Security Innovation for the Digital Economy: A Case Study of the Russian Federation**

The book is based on research in the field of trusted industrial Internet of things, collection and processing of big data, data streaming, predictive analytics, protected nano-, bio-, information and cognitive technologies. Released by the Danish publishing house River Publishers.

The second international scientific and technical conference Symposium on Cybersecurity of the Digital Economy (CDE “18) was organized and held on the basis of Innopolis University
Center of Geographic Information Systems

Determination of the boundaries of water protection zones and the boundaries of coastal protective strips of water bodies in the territory of the Republic of Tatarstan

With the help of geoinformation technologies, the center experts examined, digitized cartographic materials and determined the boundaries of 19 water bodies, including the Kazanka River and its tributaries. The results of the work will be included in the state water register and cadastral

Topography of the territory of technopolis “Himgrad” by unmanned aerial vehicles

Based on the images, an electronic cartographic database of technopolis was created for attracting investors and for internal engineering works, clearly showing all communications of the territory.

Center of Blockchain Systems

Intensive preparation of ICO projects

A 4-day intensive training of ICO projects was conducted with the use of the educational currency center ZAVOTOKEN developed by specialists.

200 people and 54 projects from St. Petersburg, Rostov-on-Don, Novosibirsk, Ulyanovsk, Perm, Yekaterinburg, Irkutsk, Odessa, Kazan and Ufa were selected to participate in the training program

Blockchain Technology

A course and workshop on “Blockchain Technology” were developed. Educational products of the center in training were used by the employees of RANEPA, Russian Railways, University “20.35”, “Islands 10-21”, RusHydro.

Study

The employees of the center and the specialists of the university conducted an all-Russian study on the topic “Legislative regulation of cryptocurrencies, ICO and blockchain technologies” with saving results in Ethereum blockchain network.

Activities of the Center

— GIS Tech Russia
  the conference on geoinformation technologies in science, business, urban services and regional management processes gistechrussia.ru.

— “Maps reading”
  Two geoinformation hackathons

— Geohack
  School Hackathon

— Roundtable discussion at the CIPR conference
  Digital space for the digital economy

— Picnic meeting
  Meeting with GIS audience in Moscow

16 grant applications
173 million rubles amount of grant applications
"Innogeotech" is an affiliated company of Innopolis University

Created to develop and pilot launch on the territory of the Republic of Tatarstan a cloud 4D-geoinformation platform (OGIP) within the framework of the “Aeronet” road map plan of the National Technology initiatives.

Works on commercialization of project results and provides services to public authorities, commercial companies and individuals.

**Areas of development:**

- focus on technology: working with large arrays of geodata, developing cloud infrastructure, machine learning and computer vision algorithms;
- creation and operation of a specialized data center for storing and processing remote sensing data for quick access to data and reducing the cost of their processing;
- Consolidation of remote sensing data capture, storage, transmission and thematic processing technologies, including multitime spatial data monitoring for efficient creation of new services;
- formation of partner ecosystem and thematic community.

**Founders:**

<table>
<thead>
<tr>
<th>49,9%</th>
<th>50,1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTI Project Support Fund</td>
<td>Innopolis University</td>
</tr>
</tbody>
</table>

**Mission of the company**

To provide new types of services in the market of remote sensing and monitoring with the help of a cloud-based geographic information platform that combines complex and resource-intensive services.

**Results**

The following subsystems of OGIP have been created:

- **Portal** Platform Administrator Workplace;
- **SSO** is responsible for the management of OGIP users and the delineation of rights;
- **Enterprise service bus (ESB)** communication software for centralized and unified messaging of events between information systems based on the principles of service-oriented architecture;
- **Geoserver** server subsystem for publishing and providing access to OGIP maps and data;
- **Ceph** Fault-tolerant storage of raster, vector, and other files;
- **Geonetwork** management of geospatial resources based on open standards;
- **Resource Manager** management of services running in the form of Docker containers of the computational cluster;
- **Kubernetes** environment for computational tasks and OGIP services launching and running;
- **Repository** Automatization and deployment of OGIP samples.
Beta versions of products and services have been created on the basis of OGIP:

— **Geocode.Storage**
cloud storage and user geodata management: import, export and conversion of data;

— **Geocode.Data**
platform for interaction between content providers and producers with consumers in order to search and purchase geodata: satellite survey, aerial photography and derived products based on remote sensing data, vector thematic data for spatial analysis, real-time geodata;

— **Geocode.Processing**
Initial and thematic user processing of geodata in automatic mode;

— **Photogrammetric processing**
cloud services for automatic processing of satellite shooting, manned and unmanned aerial photography with the construction of orthophotos and 3D models. The service is developed and based on the Photomod family products in collaboration with Racurs company;

— **Agriculture**
processing, storage and access to remote sensing and agrometeorological data for assessment of land suitability, index characteristics and condition of vegetation cover, obtaining information on types of crops, data on distribution of fertility zones, inventory of agricultural land. The service is developed on the basis of the basic software GeoMixer in collaboration with “ScanEx” company;

— **Forestry**
recognition and interpretation of forest changes on the basis of space survey: detection of deforestation, burning, windthrow and other phenomena;

— **Construction**
automatic recognition of types of permanent buildings and facilities constructions on the basis of space and aerial photography: apartment buildings, private houses, non-residential buildings, greenhouses and garages;

— **Monitoring of security zones**
automatic recognition of different classes of static objects and other changes within the protection zones by thematic scenarios using space and aerial photography: power lines, transport infrastructure, environment and emergencies. The service is developed jointly with Skolkovo Institute of Science and Technology.

**Service Solutions**

For enterprises, ministries and agriculture authorities:

- automated land use assessment: field boundaries clarification, identification of agricultural land with signs of misuse and newly plowed unaccounted territories;
- analytical processing of industry's dynamic indicators: assessment of land productivity and its market value, monitoring of land cover;
- obtaining information for forecasting yield capacity and transition to high-precision agriculture.

For Ministries of Forestry:

- detection of illegal deforestation, burnings;
- fixation of windfalls, storms, drying of woody vegetation due to diseases, pests, hydrological and climatic changes;
- detection of quarries and building on forest land.

For the Ministries of Ecology and Natural Resources:

automatic detection of shoreline's violations: the appearance of permanent buildings and facilities constructions objects.

For network and infrastructure companies:

- monitoring of the overgrowth at the protected areas with trees and cuttings, notification of the need for felling and control of clearance quality;
- Detection of illegal buildings and constructions in the security zones;
- monitoring of the road network in the areas adjacent to the protection zones to assess the traffic condition, plan the repair of the engineering infrastructure and detect unauthorized activities.
IT Business Module

Since 2016 Innopolis University has organized short-term educational programs for corporate clients.

80 programs in modules
at the customer request, each module can be modified and adapted to the industry specifics

46 teachers
21 professors and lecturers of the university with industrial experience and 25 external expert practitioners

2,829 people from 21 companies have been trained

44,7 Total revenue (RUB mln)
16 modules

- Digital Transformation Management
- IT Management
- Project Management
- Software Engineering
- Information Security Management
- Big Data Management
- Robotics
- Cloud technologies
- System Programming
- Geographic Information Systems
- Advanced and Virtual Reality Technologies
- Cyberphysical Safety of ACS TP Systems
- Interface Design
- Product Development Management
- Blockchain
- Technological Entrepreneurship

Achievements

By order of STI University “20.35” specialists of Innopolis University developed and conducted educational programs on blockchain technologies within the framework of the “Island 10-21 project”. Within the framework of "Megafon" grant 1,124 specialists were trained.

The first big data educational camp was held — Data Science Camp.

University specialists conducted a training program “Digital Transformation” for 100 heads of ministries of the Republic of Tatarstan.
Specialized IT Training Center

336 graduates
According to the target format of training: 189
The remote learning format (opened in 2018): 74

14,111 applications for training received by the center in 2018

Targeted training
Implies subsequent employment after educational program completion.

Candidates who have passed multi-stage selection study free of charge.

Graduates get a job in the resident companies of SEZ “Innopolis” or in the company that ordered the courses.

Employers

Яндекс
Сбербанк
Восход
ИнноСофт
МТС
РТН Софт Лабс
Innopolis University
Ayteko
Google
Иннодата
ICL
Тинькофф
Bank of Russia
10 programs of additional professional education were conducted by the specialists of the center

Full-time training: 8
Remote training: 2

Full-time training

Software developer using Java Enterprise Edition technologies (Middle program)
Software developer using Java Enterprise Edition technologies (Middle program)
Developer of corporate mobile applications based on Android (Middle program)
Enterprise Software Testing Specialist (Middle Program)
Industrial Software Development new on Javascript (Junior program)
Industrial Software Development new on Javascript (Junior program)
Corporate Developer of mobile applications based on iOS (Middle program)

Remote training

New

Principals of Industrial Java Software Development (Junior program)
Software developer with the use of technologies of Java Enterprise Edition (Middle Program)
Graduates in the employment market

150 graduates

57 bachelors

93 Master’s degree

100% graduates are employed

Students work at the Innopolis University and in resident and partner companies SEZ “Innopolis”:

- Kontur Innovatizii
- CITRONIX Telecom Solutions
- Innopolis University
- Ak Bars Digital Technologies
- EORA Data Lab
- Yandex. Technologies
- WF-inno
- KiWI Platform
- Innodata
- Open Mobile M Platform
- OWN
- RoadAR
- FIX
- New Trading Technologies
- Portavita
- BARS Group
- ICL System Technologies
- Diginavis
- IndaSoft Innovation
- Innovative Information Protection
- Provectus Labs
- RTK Soft Labs
- TatMobilInform CDC
- Tinkoff Development Center
- ISALES
- Innosoft
- Sberbank
- RPE “Svyaz-Management”
- BeTrip
- Vizioloji Technologies
- G Di Inno
- SONOGRA
- Soramitsu Labs
- SCB Infomatics
- GROUP IB
- AnP Vorxell
- Zarnitsa-Innovations
- MONK
- Enibots
Students of Innopolis University were accepted to positions of:

- Data Scientist
- Java Developer
- JavaScript Developer
- Python-developer
- Security Engineer
- Devops-engineer
- NET-Developer
- Robotic Engineer
- Project Manager
- Android Developer
- C++ programmer
- Scala Developer
- IOS-developer
- System Analyst
Internships

313 students have completed internships in 2018

91 administrative (first year of bachelor's degree)

Innopolis City Hall

Center of Geographic Information Systems of Innopolis University

6 departments of Innopolis University:
Admission and applicants recruitment;
Project Olympiads;
Subject Olympiads;
Information Technologies;
Educational programs;
Support and Students Development.
industrial
(2nd and 3rd year of bachelor’s degree)

40 companies and organizations:
Flatstack
Biolink
Roadar
UNITS
RTK Soft Labs
Soramitsu Labs
Zarnitsa
G Di Inno
MTS
Innodata
Denet
AnP Vorxell
BARS Group
OWN
Provectus
Voshod
Warefly
Speakphone
Innosoft
Rokilabs
Korzilla

Medi IT
SVFINANS
Tinkoff Center
development
PRIME GAMES
Jet BI
DeCenter
Google
KazanExpress
Research Institute
of Railway Transport
Uplab
Ak Bars Digital
Technologies
Dooglys
SKB Contour
Inteldiz
Tomat
Zero to One labs
BeTrip
KFU ITIS
Ak Bars Bank

117
scientific
(2nd and 3rd year of bachelor’s degree)

Foreign universities:
The Cologne Game Lab, TH Koeln (Germany);
Hallym University (South Korea).

Laboratories of Innopolis University:
Machine learning;
Cyber Physical Systems;
Intelligent Transportation Systems;
Software Engineering;
Architectures and Models of Software Engineering;
Development of Industrial Software;
Intelligent Robotic Systems;
Development of Games and Artificial Intelligence.
Innopolis University has created a startup incubator for the development of student entrepreneurship and assistance in the development of projects.

**Startlab supports students and graduates**

- Business plans drafting
- Assistance in the document preparation for participation in grant state programs
- Submission of applications to venture funds, as well as full support of student startups
Results

- Innopolis University has signed an agreement on joint implementation of student startups with the Technopark “Russkii” of Eastern Federal University. Pilot introduction of startups is scheduled for the second quarter of 2019.

- Innopolis Startlab University Incubator has successfully passed the certification in the Innovation Assistance Fund and has been admitted to the pre-acceleration of the winners of the “Smart” program in 2019 — 2020. The first group is scheduled to begin training in February 2019.

- A cooperation agreement was signed in the field of startups with Yakutia Technopark. In the first quarter of 2019 it is planned to launch a joint educational multimedia online platform.

- The Expert Council of Innopolis University selected five start-ups of university graduates to register them in the SEZ “Innopolis”.
Personnel policy

297 employees were hired in 2018
Scientific and project activities: 189
Teaching staff: 24
Pre-university education: 37
Administrative staff: 47

Employees are provided with
Voluntary medical insurance
Fares Kazan — Innopolis — Kazan
50% discount on attending the sports complex
Discount on meals
Housing in Innopolis

KPI
The KPI system has been introduced — the system of setting and monitoring key performance indicators of employees on the corporate portal has been automated.
Career Development Centre

13 programs of additional education (168 graduates):

7 internal training programs for university employees

- Provision of first aid
- Labour safety
- Fire Safety
- Project Management
- Pedagogy
- Presentation and public speaking skills
- Effective communication

6 external training programs

- Career consultant: competence development of HR-specialists
- Career consultant: practice of competence development of HR-specialists
- Soft skills for IT field: competence development for IT specialists in the development of communicative and managerial competencies
- HR-Weekend: competence development of HR-specialists
- IT-Weekend: occupational guidance for teenagers and their parents
- Middle QA-Engineer: training of testers

8 strategic sessions for industry representatives, educational workers and civil servants

- AK BARS INSURANCE
- X5 Retail Group Innopolis School
- 17 ministries, 7 committees, 9 departments and 3 inspections of the Republic of Tatarstan
- Department of Pre-University Education of Innopolis University
Development of staff capacity

227 employees have undergone external training in the following areas:
- Higher education and pedagogy;
- Technical competence;
- Personnel management;
- Mandatory courses according to the legislation.

205 people have passed the annual assessment of staff capacity.

257 employees have passed advanced training courses.

511 entrants have passed the assessment of competences on face-to-face selection.

A series of lectures Get-to-know IU about university departments results was organized for university employees.
Innopolis University is a unique educational hub that combines the fundamental base of the Russian higher mathematics school, the expertise of the world's leading universities in the field of computer science and a close integration of research areas with the challenges of the industry.

In 2012, we created not just a new higher education institution, but a modern IT university of a full cycle. Here we work with young people starting from the moment when schoolchildren choose the future professions to the employment of our graduates in leading IT companies.

Our university works in continuous partnership with the largest players in the market of technical and logical solutions, who are also interested in making the acquired knowledge relevant and practical. Therefore, we have included in the educational process a lot of practical tasks and introduced the up-to-date tasks of science-intensive programming in our Olympiads.

We are open to new ideas and interesting proposals and invite all like-minded people to cooperate: professors, researchers, students, schoolchildren and professionals from the industry willing to develop in the field of computer science.
“We have created not just a new higher education institution, but a modern IT university of a full cycle”
Research Laboratories

- Machine Learning and data reporting
- Artificial Intelligence in Game Development
- Cyber Physical Systems
- Software Engineering
- Intelligent Robotic Systems
- Data Mining and Financial Technologies
- Analysis of Data and Bioinformatics
- Operating Systems, Programming Languages and Compilers

(new)
Industrial Software Engineering

Networks and Blockchain Technologies

Cloud Systems and Virtualization Technologies
4 new laboratories

Operating systems, programming languages and compilers

Aims:

- conduct research and development according to the profile of the laboratory;
- support the educational process at the university: training and giving the lecture courses, management of semester, diploma and industrial projects of bachelors and masters, management of PhD dissertations of postgraduate students;
- promote the laboratory results on international platforms;
- establish close and long-term cooperation with industry.

Tasks:

- Software tools
development of theoretical basis, methods and technologies of creation: compilers, verifiers, debuggers, integrated development environments, etc.;

- New Generation Programming Languages
design and implementation of universal and problem-oriented PL of the new generation;

- Compilation of programming languages
research and development of advanced methods and technologies;

- Next Generation Operating Systems
development of design principles and methods;

- Standard mathematical functions
development of principles and methods of formal specifications.

Data Mining and Financial Technologies

Head: Alexey Kanatov

Aims:

- involve the leading players of the financial market in the preparation of students and carry out research projects;
- increase the research value of Innopolis University;
- attract experts in the financial field and data science to create a laboratory team;
- establish partnerships with industrial companies for joint research projects and lectures.

Tasks:

- to design and conduct fundamental courses for Innopolis University curriculum;
- to establish relationships with local companies;
- to train students in applied finance;
- to support the activities of the university, the department and the institute.
**Data Mining and Bioinformatics**

Head: Yaroslav Kholodov

**Aims:**

Advanced research in the field of data analysis using applied and theoretical approaches to obtain meaningful results which are of interest to the scientific community and applicable in everyday life.

**Tasks:**

- Data Mining;
- modeling of protein interactions with the use of bioinformatics;
- development of deep learning methods for peptide protein docking;
- assimilation of large traffic data's volume from different types of sources;
- modeling of road traffic with the use of traffic lights' adaptive control algorithms to improve the efficiency of use of the transport network;
- prediction of situations on the roads in the modes of regularly repeated and suddenly occurring overloads of the transport network;
- development of algorithms for automated intelligent transport systems (ITS).

**Networks and Blockchain Technologies**

Head: Rashid Hussein

**Aims:**

- conducting advanced research with the use of applied cryptographic, non-cryptographic, theoretical-game, optimization approaches;
- working in the field of security of networks, services, information and applications;
- carrying out research tasks to meet the needs of society in information security;
- focusing on the security of special networks and their varieties, clouds, the Internet of things, programmable networks, content-centric networks, and blockchain for limited environments.

**Tasks:**

- scientific publications in journals of categories A and B;
- Presentations at conferences of categories A and B;
- organization of a summer research internship for students of Innopolis University and graduate students from partner universities.
Laboratory results

**Industrial Software Engineering Lab**

Head: Giancarlo Succi

- designed a new course “Networks”;

**Cyberphysical Systems Lab**

Head: Alberto Silitti

- investigated application of agile approaches in CPS industrial conditions;
- developed a structure for assessing customer satisfaction with agile approaches;
- analyzed the failure prediction models that can be used in CPS operation and presented a study at the IEEE International Conference on Communication, Control and Computing Technologies for Smart Networks (SmartGridComm 2018) in Denmark;
- completed the development of the first early confirmation of the InnoScooter concept.
Data Mining and Bioinformatics Lab

Head: Yaroslav Kholodov

🌟
The laboratory team took the 1st place at a hackathon with the project “Bayesian Localization of the Vehicle”

- laboratory specialists have developed, modeled and tested an operating traffic control system for the part of Montgomery district, Maryland, USA, which organizes computational, communication and automotive technologies:
  
  — Minimizing congestion by increasing traffic capacity;
  
  — Improving safety by reducing driver errors through the use of joint adaptive cruise control strategies that increase traffic capacity while maintaining security;
  
  — Suppression of the growth of parking costs by minimizing the number of standing vehicles and the number of cars looking for parking;

- Head of the Laboratory Yaroslav Kholodov participated as Deputy Chairman of the Committee of ITS Forum — Kazan Conference “Modern Problems of Life Safety: Intelligent Transport Systems and Situation Centers” under the chairmanship of the rector of Innopolis University Alexander Tormasov.

Laboratory employee Andrey Alekseeenko made a presentation on the project “Bayesian Vehicle Localization” at IEEE Intelligent Vehicles Symposium in China.

Software Engineering Lab

Head: Manuel Mazzara

- participated in international Erasmus + projects;
- participated in the 32nd IEEE International Conference on Modern Information Networks and annexes, at the International Conference on Software Development and the International Conference on Service-Oriented Computing;
- published research results in the “Modeling and Analysis of Information Systems” journal.
Artificial Intelligence in Game Development Lab

Head: Joseph Brown

⭐

1 out of 10 published scientific articles received h5 index of h66 at IEEE CEC, the world's largest conference on computational intelligence

- laboratory staff launched two courses in the field of games and artificial intelligence;
- laboratory was included in the list of Researchers Active in Technical Games Research as the only internationally recognized laboratory for the development of games in Russia.

Laboratory of Network Technologies and Informatics

Head: Juyong Lee

- Laboratory members spoke at the international conferences PIMRC and Wimob;
- The laboratory began cooperation with experts in testing automotive self-organizing networks VANET and software.
Machine Learning and Data Presentation Lab

Head: Adil Khan

- the publications of the employees were included in the proceedings of the 19th International IEEE / ACIS Conference on Software Development, artificial intelligence, network technologies and parallel / distributed computing.

Cloud Systems Lab

Head: Vadim Malyshev

- experts have completed work on the project “Geomechanika” in the framework of the agreement with PJSC “Gazprom”, having developed a prototype of a complex information system for numerical solutions and construction of one-dimensional and three-dimensional geomechanical models;

- prototypes of cloud geoinformation platform, photogrammetric and thematic services have been created within the framework of the Digital Model of RT project.
1 155,53 million rubles were awarded in grants and obtained in tenders

Grants and projects won: 15
Amount of applications awaiting resolution: 495 million rubles

<table>
<thead>
<tr>
<th>Fund</th>
<th>Project</th>
<th>The amount, mln. rub.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTI</td>
<td>Center of Robotics Technology Components and Mechatronics</td>
<td>950,0</td>
</tr>
<tr>
<td>FCP</td>
<td>Creation of commercial urban transport with intelligent driver assistance system City Pilot</td>
<td>140,2</td>
</tr>
<tr>
<td>Aeroflot</td>
<td>Technical Support for ARIS Licenses</td>
<td>34,47</td>
</tr>
<tr>
<td>RSF</td>
<td>Development of new mathematical methods and algorithms for analysis of X-ray images of thoracic organs</td>
<td>15,0</td>
</tr>
<tr>
<td>RFFI, Russian Fund of Federal Property</td>
<td>Development of modeling methods of robotic systems with mechanical compliance and shortage/overage of controlling actions, position control algorithms and system elastic properties</td>
<td>6,0</td>
</tr>
<tr>
<td>Khimgrad, AO</td>
<td>Topographic survey of M 1:500 scale</td>
<td>1,9</td>
</tr>
<tr>
<td>Russian Fund of Federal Property + the Academy of Sciences of the Republic of Tatarstan</td>
<td>Development of an early warning system of computer attacks on critical infrastructure</td>
<td>2,2</td>
</tr>
</tbody>
</table>
3 321,24 million rubles

The amount of submitted applications for grants and tenders

Applications for grants and tenders: 80
Applications pending a final experts resolution: 16

<table>
<thead>
<tr>
<th>Fund</th>
<th>Project</th>
<th>The amount, mln. rub.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russian Fund of Federal Property + the Academy of Sciences of the Republic of Tatarstan</td>
<td>Algorithms and software development automatic filtering of X-ray images</td>
<td>2,4</td>
</tr>
<tr>
<td>RFFI, Russian Fund of Federal Property</td>
<td>Intelligent techniques of creating and improving of primitives movements for anthropomorphic robots</td>
<td>1,0</td>
</tr>
<tr>
<td>RFFI, Russian Fund of Federal Property</td>
<td>Development of stiffness model and compensation techniques mobility for walking anthropomorphic platforms</td>
<td>1,0</td>
</tr>
<tr>
<td>Ministry of Ecology of the Republic of Tatarstan</td>
<td>Determination of water protection areas and protected shoreline belts</td>
<td>0,97</td>
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<tr>
<td>Ministry of Information Technologies and Communications of the Republic of Tatarstan</td>
<td>Training staff of the Ministry of Information Technologies and Communications of the Republic of Tatarstan</td>
<td>0,25</td>
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<td>0,14</td>
</tr>
</tbody>
</table>
Scientific publications

- 2013: 1
- 2014: 5
- 2015: 41
- 2016: 73
- 2017: 74
- 2018: 110

- 2013: 0
- 2014: 3
- 2015: 33
- 2016: 62
- 2017: 41
- 2018: 34

- 2013: 0
- 2014: 2
- 2015: 3
- 2016: 12
- 2017: 15
- 2018: 45
110 publications and Scopus articles

34 publications and Web of Science articles

45 publications and RSCI articles
International cooperation

41 academic partners

9 new partners

Ratings of Higher education institutions

Information about the university activities got into the database of universities international ratings:

QS World University Rankings

Times Higher Education

Webometrics Ranking of World Universities

Round University Ranking, U-Multirank

Erasmus+

Since 2016, the Dublin Institute of Technology and Innopolis University have been working on a joint grant aimed at academic mobility of academic staff for conducting seminars, joint research, sharing the experience and arranging trainings.

In 2018, the IT University signed an agreement on Erasmus + program with The Messina University (Italy). Regarding academic exchange of students and research staff members of the universities.

Memorandums of Understanding

Indian Institute of Technology Patna (India)

International Institute of Information Technology, Hyderabad (India)

University of Malta (Malta)

American University of Malta (Malta)

Siberian State University of Geosystems and Technologies (Russia)

Agreements on cooperation and academic exchange

University of Luxembourg (Luxembourg)

L'Aquila University (Italy)

Shenzhen Institute of Advanced Technology (China)

Hanyang University (South Korea)
Exchange of students

15 outbound students

5 to the Seoul National University, South Korea
3 to the Middle East Technical University, Turkey
2 to the National University of Singapore
2 to the Polytechnic University of Catalonia, Spain

1 to the Polytechnic Institute of Grenoble, France
1 to the University of Technology of Milan
1 to the Research University of Information Technologies, Mechanics and Optics, Russia

2 inbound students

1 from the University of Bonn, Germany
1 from the Polytechnic University of Catalonia, Spain
Features of education

Bachelor’s degree program

**Training program “Informatics and Computer Science”**

During first two years of the program, the students study basic disciplines in engineering, math and computer science. During the 3rd year, students choose one of three tracks to continue their education and complete their thesis in the 4th year: software development, big data science and robotics.

**Profile “Computer Science”**

Profile “Computer Science” This Bachelor program track is performed in collaboration with Skoltech. In November 2017, Skoltech faculty selected the first group of Innopolis students for training. In 2019, 11 students will complete their Bachelor’s degree at Innopolis University and will get opportunity to be enrolled to Skoltech Master’s program.
Master’s degree program

Data Science
The curriculum is focused on training of specialists in the interdisciplinary field of big data science. Students participate in research work and in solving real tasks of the University’s industrial partners. This provides the graduates with competencies required for research activities in IT companies.

Robotics
Students gain knowledge in computer science, robotics and programming. The program core is a graduate thesis, in terms of which the students work on the real issues in the field of robotics, improve their teamwork skills and apply the gained knowledge in practice.

System and Network Engineering
The curriculum contains disciplines allowing the students to become professionals in the field of IT security: courses of lectures on Security Basics, Cybercrimes and Forensic Science, Distributed Systems, Advanced Security Technologies and Network Technologies. Graduates are able to design and develop corporate and private systems, taking into account modern requirements of IT security.

Software Engineering
The program is designed for professionals with the experience in software development. Students systematize and deepen their knowledge of software development and improve their skills of an IT project manager, software architect or technical leader. The final team project is a test of acquired knowledge and skills on essential tasks of IT companies.
Courses

135 total courses
2017—2018: 118
2016—2017: 84
2015—2016: 34

68 core courses
Bachelor’s degree program: 36
Master’s degree programs: 32

Bachelor’s degree program
Data Structure and Algorithms
Analytical Geometry and Linear Algebra I
Analytical Geometry and Linear Algebra II
Computer Architecture
Architectures for Software Systems
Life Safety
Introduction to Machine Learning
Introduction to AI
Introduction to Programming I
Introduction to Programming II
Introduction to Robotics
Introduction to Big Data
Discrete Math and Logic
Differential Equations
English
History
Networks
Mathematical Analysis I
Mathematical Analysis II
Academic Research
Low and Embedded Level Programming
Digital Signal Processing
System Theory
Operating Systems
Academical Writing and Research Culture
Data Modeling and Databases
Data Modeling and Databases II
Compilers Construction
Software Project
Distributed Systems and Cloud Computing
Theoretical Mechanics
Theoretical Computer Science
Probability and Statistics
Physics
Sports
Philosophy
Advanced Information Retrieval
Cybercrimes and Forensics
Computer vision
Advanced Networking
Cybercrimes and Forensics
Computer vision
Advanced Networking
Machine Learning (advanced course)
Methods: Deciding what to Design
Metrics and empirical methods for software engineers and data scientists
Models of Software Systems
Optimization
Security Systems and Networks
Advanced Statistics for DS
Industrial or Research Project
Development of web apps
Distributed Systems
Sensation and perception
Advanced Robotic Manipulation
Modern Control Paradigms
Big Data Technologies and Analytics
Offensive Technologies
Large Installation Administration
Software Engineering

Master’s degree program
High-Dimensional Data Analysis
Analysis of Software Artifacts
Security of Systems and Networks
Advanced Security
Introduction to Scientific and Research Activities
Randomized Algorithms
Virtual Reality
Computational Intelligence
Deep Learning
Dynamics of Nonlinear Systems
Intelligent Mobile Robotics
**Technical:**

- User Experience and User Interface Design Fundamentals
- Procedural Content Generation in Games
- Algorithms of Machine Learning
- Lean Software Development
  - Introduction to Convex Optimization
- Decentralized and Distributed Systems
- SE Project
- Data Mining
- Information Retrieval
- Software Quality and Reliability
- Problem Solving Logic
- Mechanics and Machines
- Cloud Computing
- Natural Languages Processing and Machine Learning
- Advanced Optimization
- Pattern Oriented Design
- Advanced Statistics
- Practical Artificial Intelligence
- Practical Machine Learning and Deep Learning
- Geometry in Computational Applications
- Programming in Haskell
- Programming of Distributed Registry Systems and Cryptocurrencies
- Software Systems Design
- Human Computer Interaction Design for AI
- Enterprise Programming on Javascript
- Advanced Enterprise Programming on Javascript
- Industrial Programming in C++
- Industrial Programming in Java
  - (Android)
- Industrial Programming in Java
- Advanced Industrial Programming in Java
- Mobile Application Development Using Qt
- Advanced Mobile Application Development Using Qt
- Front-end Web Development
- DS Project
- Product Design
- R Project
- Distributed Systems and Middleware: Patterns and Frameworks
- Reverse Engineering
- Innovative Software Engineering
  - Best Practices
- Software Requirements and Specifications
- Total Virtualization
- Control Theory
- Game Theory for Data Science
- Software Testing
- Deep Learning and Neural Networks Technologies
- Crypto-currency and Bitcoin Technologies
- R&D Performance Management
- Functional Programming in Scala Language
- Windows Kernel: Architecture and Drivers

**Humanitarian**

- Introduction to IT Entrepreneurship
- Introduction to Financial Management
- Venture Capital Hacks: From Zero to Negotiating and Investment Deal
- Technical Writing and Communication
- Design Thinking
- Fearless Ideas
- International Trade: Procedures and Regulations
- Introduction to Communication
- Fundamentals of Marketing
- The Fundamentals of Public Speaking - How to Deliver Effective Presentations
- Legal Literacy for IT Specialist
- Psychology
- Career Development
- Russian as a Foreign Language
- Philosophy of Information
- Economics of Entrepreneurship
- Science Ethics
- Legal Basics for International Business
Postgraduate training program

09.06.01 "Informatics and Computer Science"

Since 2018, Innopolis University has opened postgraduate training programs.

Applications for the program are accepted from the participants with a master or specialist degree, from Russia, CIS and far-abroad countries.
Education quality control

**Intramural assessment**
The quality of the disciplines — the unscheduled classes observations of other representatives of the faculty staff and the university administration.

**Anonymous student survey**
On the quality of the courses. It is held after academic semester before the exams. Feedback, comments and suggestions are sent to the professors and administrations for further processing.

**Mid-term**
Summing up the interim results of mastering the courses by students, in order to monitor their progress in studies.

**Mid-term meetings**
Mid-semester meeting of professors and students to get feedback and to improve courses knowledge.

**Comprehensive exams**
Exams covering material from several core courses. Based on the results, the university experts analyze how well the students learned the curriculum for the period of 2 years.

**Weekly meetings with group leaders**
**Student Affairs, Support and Development**

**Student associations**

49 student clubs and associations

12 new student clubs

Created on the initiative of students with the University's support. Personnel of the Student Affairs Department has created a portal campuslife.innopolis.ru, providing information about projects and activities of the student clubs.

Among the new student clubs are the first university media - Innopolis Media Club, the Tabletop Games Club, the management skills improvement club - Project Management Professionals.

**External events and competitions**

116 students participated in conferences, hackathons, olympiads and competitions in Russia, Belarus, the Czech Republic and Japan. The Innopolis University team in Competitive Programming reached the semifinals of the ICPC NEERC 2018–2019 Championship.

**Student Development Workshop 2018**

53 Russian specialists in the field of youth outreach and non-formal education discussed modern international practices of students development. With the support of Erasmus+, the workshop has been attended by an employee of Dublin Institute of Technology, Brian Gormley (Ireland). Since 2018, the event has become annual.

**Psychological support**

310 consultations of a professional psychologist

122 students and employees applied

- 23 workshops on psychological health and meetings within the framework of The art therapy project;
- 1 study of the level of psychological comfort and adaptation of students, which involved 82% of students.

**InnoBootCamp2018**

254 new students completed special two-week adaptation course, developed jointly with current students according to the design thinking technology.
30 events arranged by the students

**Innopolis Football League**
The first ever football championship in the city of Innopolis, bringing together the students, the employees of the University and Technopark and the city residents.

**InnoCTF 2018**
Annual cyber security competitions, being attended by the participants from 8 Russian cities, in 2018.

**Student Club Fest 2018**
Annual fair of student clubs with competitions and performances by talented students has been attended by 400 students, employees and residents of Innopolis.

**Spring Ball**
30 pairs of students and employees for 2 months prepared performances with the support of dance student clubs.

**Big Student Hackathon**
The first Big Student Hackathon: ML for Fun || Money

**CyberCup**
Two eSports Championships

**Cyber-Halloween 2018**

**Global Game Jam**
Pre-university training

7 sites of STEM-centers

⭐

5 new sites of STEM-centers

In total, there are 7 sites where 220 school students are engaged in mathematics, programming, robotics and project activities.

22 educational programs have been developed by the Pre-University Education specialists.

15 shifts for 783 school students of different age groups and fields of study

Winter School of Informatics Olympiad Training

78 participants 23 regions of the Russian Federation

4 countries: Russia, Tajikistan, Kazakhstan, Uzbekistan

Winter School of Robotics Olympiad Training 2018

55 participants 15 regions of the Russian Federation

2 countries: Russia and Kazakhstan

Summer School of Informatics Olympiad Training

109 participants 30 regions of the Russian Federation

3 countries: Russia, Kirghizia, Tajikistan

Project School

77 participants 26 regions of the Russian Federation

17 tutors, 5 companies which have provided tasks, 4 lecturers from the industry, 20 projects in 5 focus areas: Chatbots Development, Blockchain, Geoinformation Systems, IT security, Robotics.
Project Olympiad Summer School in "Fintech" profile

36 participants
18 regions of the Russian Federation
2 countries: Russia and South Ossetia

3 focus areas: intelligent robotic systems, software engineering of financial technologies, information security of networks and systems. Teachers are the coaches of the Olympiad winners and industry representatives. Topic — “Biometrics”.

Educational JAVA start shift

42 participants from the Republic of Tatarstan

Shift in Olympiad mathematics for 6th grades

24 participants
2 regions of the Russian Federation

Advanced training courses in the Olympiad Robotics

90 participants
28 regions
3 countries: Russia, Belarus and Ukraine

Republican Robo Camp

129 participants from the Republic of Tatarstan

2 shifts of practice-training sessions in robotics

58 participants from the Republic of Tatarstan

At the World Robot Olympiad in 2018, the Republic of Tatarstan has been presented by 5 teams, 2 of which brought gold and bronze medals. This is the first time since the existence of the Russian Robot Olympiad.
Olympiad events

**Russian Robot Olympiad**

- **14** focus training areas
- **43** winner teams and prize-winners
- **237** teams
- **474** participants
- **50** regions
- **172** coaches

**330** persons have learned refereeing on the basis of IT University

Innopolis University hosted the Olympiad for the fourth time. Since 2014, the Russian IT University is the national operator of the World Robot Olympiad and organizer of the Russian stage of the competition.

The University builds and trains the national team for participation in the International Olympiad.

**World Robot Olympiad**

19 teams from 10 regions of the Russian Federation presented Russia at the World Robot Olympiad in Thailand.

🌟 Victory in the Future Innovations nomination for simplicity and elegance of the robot design

□□□ 2 gold and 1 silver medal

**EJOI is the Olympiad for juniors from the Council member countries**

🌟 Russian participants took the first position in the team scoring

These are the school students, who demonstrated the best results at the final stage of the Russian Olympiad in Informatics for School Students and at the selections arranged by the Innopolis University.

- **21** countries
- **80** participants

**Innopolis Open**

Annual Innopolis University Olympiad in Mathematics and Informatics for School Students.

In 2018, the Innopolis Open in "Informatics" profile, gained the 1st level according to the Russian School Olympiad Council, "Mathematics" - the 3rd level.

- **14** countries
- **320** participants
- **51** regions of the Russian Federation
Cyber Security Tournament for School Students InnoCTF Junior 2018

The first tournament in CTF format at the Innopolis University for 8—11 grades students of educational institutions and from foreign countries.

550 participants  57 regions
3 countries: Russia, Ukraine, Kazakhstan

Profile of the National Technology Initiative Olympiad: “Intelligent Robotics Systems”

3 Russian School Olympiad Council level  38 finalists in Sochi  11 regions of the Russian Federation

APIO Asia-Pacific Online Olympiad in Informatics

Star
Top-6 Russian participants won gold medals

In 2018, the Innopolis University acted as technical organizer of the Olympiad. Of 6 Russian participants, the two best results were shown by the students from the Republic of Tatarstan, who only came of second best after the representatives of China.

568 participants  29 countries

Profile of the National Technology Initiative Olympiad: "Software Engineering of Financial Technologies"

3 Russian School Olympiad Council level  24 finalists in Innopolis  11 regions of the Russian Federation

STEM Olympiad in mathematics for 4 — 6 grades

Star
According to the results of the full-time stage, the Junior Olympiad Division in Informatics of the Republic of Tatarstan is defined

142 participants  4 regions of the Russian Federation

Project competition of scientific and technical research papers of school students — ROST

It is held in the format of a poster session, where the participants defend their projects before the scientific judges. A team for the World Intel ISEF competition is being formed. The contest has been held since 2007, was held in Innopolis for the first time in 2018.

7 focus areas: informatics, mathematics, physics, engineering and technology, chemistry, biology and medicine, environmental sciences.

21 regions of the Russian Federation  83 participants of a full-time final  4 teams will join the world stage of the competition
Events & PR

214 events have been hosted and organized

147 internal events

67 external events

Opening of the National Center of NTI Competences in Robotics and Mechatronics

June 6

The final stage of the Russian Robot Olympiad 2018

June 22 — 24, 1000 participants and guests
18 077
the guests visited the IT University

94
delégations

European Junior Olympiad in Informatics (eJOI)
July 27 — 31, 250 participants and guests

GIS Tech Russia
December 14 — 15, 271 participants

42nd School-Conference “Information Technologies and Systems — 2018” (IT&S18)
September 25 — 30, 130 participants and guests

Privolzhsky research and technical competition of school student’s scientific papers “ROST-ISEF”
November 3 — 5, 143 participants and guests
Russian and international IT events were held with informational support of Innopolis University in 2018.
The National Center of Scientific and Technical Information Competences in Robotics has been opened at the Innopolis University.

Specialists of the Innopolis University have successfully tested a cargo drone.

Innopolis University and Gazprom will develop IT solutions for the Russian Oil and Gas Industry.

100 Master's degree and 49 Bachelor's degree students have graduated from the Innopolis University in 2018.

The Republic of Tatarstan and X5 Retail Group will develop innovations for retail at the Innopolis University.
Documentary movie on the TV channel "Russia — Culture" about the city of Innopolis and the Innopolis University
Innopolis University and Russian Robot Olympiad (+ WRO)

**289** publications in 2018 (151 in 2017)

**1 919** presentation slides

**1 077** pages of printed materials

**20** logos

**15** brand styles

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**Publication of the book “The Truth Machine” together with MIF**

- **Coverage:** 4 100 149
  - **Subscribers:** 22 335
  - **Views:** 63 800

- **Coverage:** 264 010
  - **Subscribers:** 3 289

- **Coverage:** 1 007 135
  - **Subscribers:** 5 405

- **Views of publications:** 54 229
We thank the Innopolis University sponsors

Contacts

university@innopolis.ru
420500, Innopolis
1, Universitetskaya Str.

Specialized IT Training Center
stc@innopolis.ru
+7 (843) 203-92-53, ext. 258

IT Business Module
itbm@innopolis.ru
+7 (843) 203-92-53, ext. 257

STEM-Centers
stem@innopolis.ru
+7 (843) 203-92-51

For Press & Media
pr@innopolis.ru
+7 (843) 203-92-53, ext. 117

Admission
+7 (843) 203-92-53, ext. 191

Faculty Recruitment
+7 (843) 203-92-53, ext. 139

HR Department
+7 (843) 203-92-53, ext. 188

International and Academic Cooperation Office
+7 (843) 203-92-53, ext. 173
Thanks for your attention