

# Promotion Guide

## *Profiles of Belarusian ICT research organisations*

*May 2010*

**SCUBE**  **ICT**  
GATEWAY TO UKRAINIAN & BELARUSIAN ICT RESEARCH

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under the Information and  
Communication Technologies (ICT) theme

This report has been developed under the **FP7 SCUBE-ICT** project ([www.scube-ict.eu](http://www.scube-ict.eu)) by the following group of specialists:

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## Preface

The present document has been elaborated under the joint efforts of the SCUBE-ICT project consortium. **SCUBE-ICT** is an innovative EU funded initiative aiming to upgrade the cooperation in the field of Information and Communication Technologies (ICT) between EU, Belarus and Ukraine in key areas of mutual interest in order to create substantial socio-economic benefits in all three regions. A wide range of diversified activities will be implemented at two levels:

### Research / industrial level

- ✓ Analyse the Belarusian and Ukrainian research and industrial ICT domain,
- ✓ Create a 'pool' of key ICT players from Belarus and Ukraine to promote collaboration with their EU counterparts.
- ✓ Advise and consult highly motivated ICT actors from the three regions and support their collaboration under FP7-ICT research activities.

### Policy level

- ✓ Identify and analyse existing and future commonalities and differences in ICT R&D policies between EU and the targeted countries.
- ✓ Support and facilitate policy dialogue towards future cooperation directions in the ICT Research and Development field.

### SCUBE-ICT identity

<b>Title:</b>	<b>"Strategic Cooperation in Ukraine, Belarus and EU in Information and Communication Technologies"</b> (Contract No 231148)
<b>Duration:</b>	January 1, 2009 – December 31, 2010 (24 months)
<b>Website:</b>	<a href="http://www.scube-ict.eu">http://www.scube-ict.eu</a>
<b>Coordinator:</b>	International Environment and Quality Services North Greece Ltd (Q-PLAN N.G., Greece, <a href="http://www.qplanng.gr">www.qplanng.gr</a> ) -
<b>Contact Person:</b>	Mr. Kostas BOUGIOUKLIS – <a href="mailto:info@scube-ict.eu">info@scube-ict.eu</a>
<b>Consortium</b>	
The project will be implemented by a multidisciplinary and multicultural consortium of 10 partners from 5 European countries:	
<ul style="list-style-type: none"> <li>▪ <b>International Environment and Quality Services North Greece Ltd</b> Q-PLAN N.G., Greece, <a href="http://www.qplanng.gr">www.qplanng.gr</a></li> <li>▪ <b>Intelligentsia Consultants Ltd</b> Intelligentsia, UK, <a href="http://www.intelligentsia-consultants.com">www.intelligentsia-consultants.com</a></li> <li>▪ <b>ALTEC SA Information and Communication Systems</b> ALTEC, Greece, <a href="http://www.altec.gr">www.altec.gr</a></li> <li>▪ <b>Technical University of Catalonia</b> UPC, Spain, <a href="http://www.upc.edu">www.upc.edu</a></li> <li>▪ <b>Belarusian Institute of Systems Analysis and Information Support of Scientific and Technical Sphere</b> BELISA, Belarus, <a href="http://www.belisa.org.by">www.belisa.org.by</a></li> <li>▪ <b>United Institute of Informatics Problems of the National Academy of Sciences of Belarus</b> UIIP-NASB, Belarus, <a href="http://www.uiip.bas-net.by">www.uiip.bas-net.by</a></li> <li>▪ <b>Belarusian State University of Informatics and Radioelectronics</b> BSUIR, Belarus, <a href="http://www.bsuir.by">www.bsuir.by</a></li> <li>▪ <b>Lviv Centre of Scientific, Technical and Economic Information</b> LvCSTEI, Ukraine, <a href="http://www.cstei.lviv.ua">www.cstei.lviv.ua</a></li> <li>▪ <b>V.M. Glushkov Institute of Cybernetics of National Academy of Sciences of Ukraine</b> GIC, Ukraine, <a href="http://www.icyb.kiev.ua">www.icyb.kiev.ua</a></li> <li>▪ <b>Institute of Artificial Intelligence Problems</b> IAIP, Ukraine, <a href="http://www.iai.gov.ua">www.iai.gov.ua</a></li> </ul>	



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## Scope of this Guide

The document aims to highlight and promote the research competencies and interests of prominent **Belarusian ICT actors** (i.e. laboratories / departments / research units / etc within public universities and institutes or private companies), thus enhancing the collaboration potential with their EU counterparts.

### Who should read this Guide?

The Guide can be 'exploited' by the **EU research and industrial communities** to support their efforts in locating prominent research partners from Belarus. Thus, the information included acts as the *first step* to identify suitable partners and facilitates further contact towards establishing future collaborations.

### How to use the Guide?

The organisations are grouped according to their type, namely being "**public R&D organisations and institutions**" or "**private enterprises**" that exhibit research activities, and are listed alphabetically. In each profile the following information is presented:

- The contact details of the organisation;
- Its previous experience in international and/or national projects;
- Its main (research/business) achievements;
- The ICT areas each organization is interested in; and
- The contact details of the person responsible.

To ease the identification of suitable partners, the "**ICT fields of expertise**" of each organisation are highlighted so that the reader can be 'directed' to the expertise that is required to address his/her research collaboration plans.

### CATEGORISATION OF BELARUSIAN ICT R&D ACTORS

Category	Sub-areas	
<b>1. Information Processing</b>	<ul style="list-style-type: none"> <li>▪ Data Warehousing</li> <li>▪ Multimedia Databases</li> <li>▪ Data Mining</li> <li>▪ User Interfaces</li> <li>▪ Image Processing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pattern Processing</li> <li>▪ Speech Processing</li> <li>▪ Simulation</li> <li>▪ GIS information processing</li> </ul>
<b>2. Networks, Communications and Systems</b>	<ul style="list-style-type: none"> <li>▪ Broadband Technologies</li> <li>▪ Mobile and Wireless Communications</li> <li>▪ Distributed Systems</li> <li>▪ Real-time Systems</li> <li>▪ Satellite Technology</li> <li>▪ Signal Processing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Security of Networks</li> <li>▪ Privacy &amp; Confidentiality Enhancing Technologies</li> <li>▪ Mobile Security</li> <li>▪ Role-based Access Control</li> <li>▪ Advanced Cryptography</li> <li>▪ Parallel computing (GRID technologies and infrastructure)</li> </ul>
<b>3. Software and Services (Applied ICT)</b>	<ul style="list-style-type: none"> <li>▪ Software Architectures</li> <li>▪ Knowledge Management</li> <li>▪ Workflow Management</li> <li>▪ Business Process Management</li> <li>▪ Web Service Technologies</li> <li>▪ Mash-up Technologies</li> <li>▪ Semantic-based Systems</li> <li>▪ Multi-agent Systems</li> <li>▪ GRID Computing</li> <li>▪ Quality of Service</li> </ul>	<ul style="list-style-type: none"> <li>▪ eHealth</li> <li>▪ eLearning</li> <li>▪ eBusiness</li> <li>▪ eInclusion</li> <li>▪ eGovernment</li> <li>▪ Ambient Assisted Living</li> <li>▪ Bio-informatics</li> <li>▪ Environment</li> <li>▪ Energy Efficiency</li> <li>▪ Transport &amp; Logistics</li> <li>▪ Tourism</li> </ul>

Category	Sub-areas	
<b>4. Electronics and Future &amp; Emerging Technologies</b>	<ul style="list-style-type: none"> <li>▪ Control Systems</li> <li>▪ Digital Systems</li> <li>▪ Embedded Systems</li> <li>▪ Nano Technologies</li> <li>▪ Optical Systems</li> <li>▪ Smart Cards</li> <li>▪ RFID and Smart Tags</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sensors</li> <li>▪ Photonics</li> <li>▪ Nano-scale ICT devices and systems</li> <li>▪ Pervasive adaptation</li> <li>▪ Complex Systems for socially intelligent ICT</li> <li>▪ Embodied Intelligence</li> </ul>
<b>5. Cognitive Systems and Robotics</b>	<ul style="list-style-type: none"> <li>▪ Cognitive Systems</li> <li>▪ Robotics</li> <li>▪ Sensor Networks</li> </ul>	<ul style="list-style-type: none"> <li>▪ Human-machine Interfaces</li> <li>▪ Audio-visual Systems</li> <li>▪ Adaptive Systems</li> </ul>

#### Remarks

- i) Even though the main instrument of supporting international research activities is the 7<sup>th</sup> Framework Programme (FP7), such terminology has been avoided, as the formation of a research consortium towards FP7-ICT Calls for Proposals is based on the specifications of the Call (i.e. the priority areas, objectives and orientation of each Call) as well as on the structure and orientation of each individual proposal. Thus, any attempt to 'label' organisations with FP7-ICT Challenges and Objectives would limit their possibilities to be invited into international research consortia.
- ii) The lists of organisations included in this Guide are neither exhaustive nor exclusive. Furthermore, the content of each profile is exclusively under the responsibility of each organization and it shortly describes its expertise and interests for collaboration. Thus, the reader is advised to contact a potential partner to learn more about its activities and investigate areas of future collaboration.

The following table provides an overview of the "ICT fields of expertise" of each organisation. However, the reader is encouraged to contact any organisation to further discuss their collaboration potential.

## List of Belarusian ICT R&amp;D actors

ICT field of expertise Organisation	Page	Cat. 1	Cat. 2	Cat. 3	Cat. 4	Cat. 5
<b>Belarusian ICT R&amp;D Organisations and Institutes</b>						
Aerospace Educational Centre	<a href="#">12</a>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Applied Mathematics Faculty	<a href="#">13</a>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Bio-informatics Laboratory	<a href="#">14</a>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Centre of Nanoelectronics and Novel Materials	<a href="#">16</a>				<input checked="" type="checkbox"/>	
Computer Systems and Pattern Recognition Laboratory	<a href="#">18</a>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Discrete Mathematics and Algorithmics Department	<a href="#">19</a>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
High Performance Systems Laboratory	<a href="#">21</a>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Image Processing and Recognition Laboratory - "RAMONAK" R&D Team	<a href="#">23</a>	<input checked="" type="checkbox"/>				
Information Analysis Systems Laboratory	<a href="#">25</a>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Information Hiding and Data Protection Laboratory	<a href="#">26</a>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Information Protection Laboratory	<a href="#">27</a>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Information support of scientific research Department	<a href="#">29</a>	<input checked="" type="checkbox"/>				
Information Technologies and Means of Telecommunications Laboratory	<a href="#">30</a>	<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>
Mathematical Cybernetics Laboratory	<a href="#">31</a>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Mathematical Cybernetics Laboratory - "Combinatorics and Scheduling" R&D Team	<a href="#">33</a>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
Measuring Information Systems Laboratory	<a href="#">35</a>				<input checked="" type="checkbox"/>	
Nano-Optics Laboratory	<a href="#">36</a>				<input checked="" type="checkbox"/>	
Quantum Optics Laboratory	<a href="#">37</a>		<input checked="" type="checkbox"/>			
Radiophysics Department	<a href="#">38</a>	<input checked="" type="checkbox"/>				
Real-Time Digital Systems Laboratory	<a href="#">39</a>	<input checked="" type="checkbox"/>				
Systems Dynamics and Mechanics of Material Laboratory	<a href="#">40</a>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Technical Analysis of the Financial Markets Laboratory	<a href="#">42</a>	<input checked="" type="checkbox"/>				
<b>Belarusian ICT R&amp;D Enterprises</b>						
Automation-2000, LLC	<a href="#">44</a>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
AVEST	<a href="#">45</a>		<input checked="" type="checkbox"/>			
BelHard Group	<a href="#">46</a>			<input checked="" type="checkbox"/>		
Belsoft-Borlas Group	<a href="#">48</a>			<input checked="" type="checkbox"/>		
Belmicrosystems	<a href="#">50</a>				<input checked="" type="checkbox"/>	
Computer Research Institute "NIIEVM"	<a href="#">51</a>			<input checked="" type="checkbox"/>		
Centre for Identification Systems	<a href="#">53</a>			<input checked="" type="checkbox"/>		
EXON IT LTD	<a href="#">55</a>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Information Society	<a href="#">56</a>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
INIS-SOFT	<a href="#">58</a>			<input checked="" type="checkbox"/>		
Misoft NVP	<a href="#">59</a>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
System Technologies	<a href="#">60</a>			<input checked="" type="checkbox"/>		
SoftClub	<a href="#">62</a>			<input checked="" type="checkbox"/>		



## Outline of the ICT sector in Belarus

Belarus has a long tradition in the Information and Communication Technologies (ICT) and always has been in the centre of attention for foreign researches, universities and companies. Historically, the country was one of the most technologically advanced republics of the former Soviet Union, when 50% of the computers and computers' components were produced in Belarus. The country's R&D organisations have also developed technical infrastructures such as supercomputers and computer systems for different medical applications, as well as for space technologies, nanotechnologies, photonics etc.

The ICT sector is also strongly supported through the High Technologies Park, which was created in order to boost the competitive power of the national new and high technology-based sectors, developing modern technologies and expanding their exports, as well as attracting to the sector both Belarusian and foreign technologies. Its aim was to become a Belarusian "Silicon valley" starting from strengthening the position of the IT sphere, boosting exports of software and advance the e-society development in Belarus. Recently, the Park's activity is planned to be extended to other perspective modern industries: biotechnologies, nanotechnologies, green integrated technologies, etc.

At **research level**, there is a considerable collaboration potential between Belarus and EU ICT actors, mainly due to its well established educational system inherited from the Soviet times, the highly qualified human resource and the existence of considerable technical ICT infrastructures which are established in many Universities. The most prominent ICT areas of collaboration between Belarusian and EU actors are:

- **Supercomputing:** During the past 10 years Belarus has become a major player in High Performance Parallel Architecture Computers. For example the "SKIF" clusters are the key elements in several Russian-Belarusian Union State Programme such as "SKIF", "COSMOS-SG", "TRIADA" and "SKIF-GRID".
- **Grid technologies and Infrastructure:** The long tradition of Belarusian universities in supercomputers has boosted the creation of **GRID-infrastructures**, which have been connected to the European GRID structure, enhancing the collaboration opportunities between the Belarusian and EU RTD organisations and institutions.
- **Micro/nano electronics:** Belarus is considered to be a strong player in micro/nanoelectronics. Moreover, the Belarusian government is paying a strong attention to the micro/nano- development and it has approved the state competitive programme of scientific research "Electronics" and "Photonics" for 2006-2010.
- **Space/Space related technologies:** Belarus is one of the few countries in the world whose specialists have been involved in the construction of space stations. The development of space and geo-information systems are strongly supported form the Belarusian government through the adoption of various programmes such as the **National Space Programme** (2008-2012).
- **e-applications**, such as **e-health**: Belarus has a long history in electronic health and the most remarkable ICT medical systems developed by the Belarusian ICT organisations are those for histological images analysis. These systems meet the international specifications and are already used in medical organisations in Belarus.

At **business level**, Belarus possesses a significant potential in the information technologies export, especially in the field of software development and ICT **outsourcing**. The country used to be the high tech zone of the Soviet Union, where technology was used to design products for both civil and military applications. The country's reputation for scientific and IT excellence is currently complemented by the competitive labour market that has attracted the interest of numerous IT-intensive companies. Additionally, the Belarusian government is interested in growing IT exports and thus some radical regulatory measures have already been taken that create a highly favourable climate for IT businesses in the country.

The main activities of the majority of the Belarusian IT companies are focused on:

- *Bank Office Applications*, e.g. applications for corporate Finance and Enterprise Resource Planning;
- *Front Office Applications*, e.g. Customer Relationship Management (CRM) and Supply Management solutions;
- *Electronic Commerce*, e.g. applications for Web Services Development, Internet security and Electronic Marketplaces;
- *Networking and Communications*, e.g. Applications for Wireless and WAN/LAN Technologies; and
- *Software infrastructure*, e.g. Database Management systems applications.



## 1 Public ICT R&D Organisations and Institutes

## 1.1 Aerospace Educational Centre



<b>Research Organisation</b>	Aerospace Educational Centre (Belarusian State University - Faculty of Radiophysics and Electronics)
<b>Contact person:</b>	Prof. Dr. Vladimir Saetchnikov
<b>Email:</b>	<a href="mailto:saetchnikov@bsu.by">saetchnikov@bsu.by</a>
<b>Phone:</b>	-
<b>website</b>	<a href="http://www.aec.bsu.by/">http://www.aec.bsu.by/</a>
<b>Address</b>	4, Nezavisimosti av., 220030 Minsk, Belarus
<b>Short description</b>	<p>Aerospace Education Centre is a public research organization, whose main objectives are:</p> <ul style="list-style-type: none"> <li>▪ scientific and methodical, hardware and software and information security training and retraining of staff on reception, primary and thematic data processing Distance sensing of the earth;</li> <li>▪ development of new educational technologies through the use of microsattellites, including the management of spacecraft and the whole cycle of space data reception prior to the thematic data</li> </ul> <p>Additionally, the centres' research activities include:</p> <ul style="list-style-type: none"> <li>▪ Hardware and software for satellite remote sensing and telecommunication including university micro satellites</li> <li>▪ Early warning systems based on GIS technologies</li> <li>▪ Nanophotonics of sensors for detection and identification of micro particles and biological agents</li> </ul>
<b>Collaboration interest</b>	<ul style="list-style-type: none"> <li>▪ Hardware and software for satellite remote sensing and telecommunication</li> <li>▪ Early warning systems based on GIS technologies</li> <li>▪ Optoelectronic sensors</li> <li>▪ Nanophotonics</li> <li>▪ Biomedical devices</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ GIS based early warning system of chemical enterprise (Grodno-Azot)</li> <li>▪ GIS based expert flood control system for the basins of 5 rivers of Belarus</li> <li>▪ GIS of tree national parks.</li> <li>▪ A novel emerging technique for the label-free analysis of nanoparticles including biomolecules using optical micro cavity resonance of whispering-gallery-type modes is being developed.</li> <li>▪ Hardware and software for satellite remote sensing system of university satellite in the range 1.72 GHz has been developed.</li> </ul>
<b>European or National Project Experience</b>	<p>Participation in 4 joint BMBF-DFG projects (Germany), several national projects.</p> <p>At present the centre is involved in the following projects:</p> <ul style="list-style-type: none"> <li>▪ BMBF-DFG Joint Project BLR-08/002: "Development of micro resonance methods for detection and identification of micro particles and biological agents in situ"</li> <li>▪ National Program of Belarus 'Development of aerospace education system of Belarus'</li> <li>▪ Project of the National Program of Belarus in Scientific-Technical Research "Photonics" "Development of methods and compact equipment for non invasive monitoring of blood and human tissue"</li> <li>▪ Project of the National Program of Belarus in Applied Research 'GIS based early warning control system of hydro technical constructions'</li> </ul>
<b>Additional Information</b>	<p>Number of researchers: 8 (including 3 PhD)</p> <p>Number of employees in total: 12</p>

## 1.2 Applied Mathematics Faculty



<b>Research Organisation:</b>	Applied Mathematics Faculty (Belarusian State University)
<b>Contact person:</b>	Dr Pavel MANDRICK
<b>Email:</b>	<a href="mailto:FPMI@bsu.by">FPMI@bsu.by</a>
<b>Phone:</b>	(+375-17) 209-52-45
<b>website</b>	<a href="http://www.fpmi.bsu.by">http://www.fpmi.bsu.by</a>
<b>Address</b>	4, Nezavisimosti av., 220030 Minsk, Belarus
<b>Short description</b>	<p>Along with educational process the Faculty of Applied Mathematics of Belarusian State University accomplishes the research in IT in cooperation with the Research Institute of Applied Mathematics and Informatics of Belarusian State University. The faculty contains 12 chairs and 8 IT research laboratories to develop mathematic methods, algorithms and software. The main research activities of the Faculty of Applied Mathematics are:</p> <ul style="list-style-type: none"> <li>▪ applied probabilistic analysis (design and optimization of control in telecommunication networks, distributed data bases, bank systems),</li> <li>▪ mathematic methods of information security;</li> <li>▪ statistical data analysis and modeling (methods, algorithms and software for modelling in economy and transportation);</li> <li>▪ methods of synthesis and analysis of dynamic systems</li> <li>▪ modelling the physical processes;</li> <li>▪ computer graphics;</li> <li>▪ operation research and IT</li> </ul>
<b>Collaboration interests</b>	Methods, algorithms and software development for economy, business, transportation, bank systems, dynamic processes modelling.
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ "Geo data base" – intellectual computer system for oil production modelling</li> <li>▪ "Ortho Expert" – the system of making decision support in orthopaedic</li> <li>▪ Russia-Belarusian and Belarusian-Russian translation system</li> <li>▪ ManManager – geo-information system for visualization and processing the vector maps and related data bases.</li> <li>▪ "Sirius" – software for calculation and optimization of probabilistic characteristics of telecommunication systems</li> <li>▪ Stat Pro – the package of software for statistic prognosis</li> <li>▪ Rostan - software program of robust statistic analysis</li> <li>▪ SAMP – system of electrometric modelling and prognosis</li> </ul>
<b>European or National Project Experience</b>	<ul style="list-style-type: none"> <li>▪ Project ISTC B-1213 Contrast agents dynamic in biomedical applications, 2005 – 2009</li> <li>▪ Project of Belarusian Fund of Fundamental Research Ф08Д-003 Generation and evolution of defect clusters along fast silicon ion trajectories</li> <li>▪ Project RD50 Distribution of electric field and charged defects concentration in silicon</li> <li>▪ Grant № MOEHRD KRF-2008-521-D00056 The investigation of queue discipline systems with variable working regimes, 2008 – 2009:</li> <li>▪ Grant MOEHRD D -200 7 -521-D00330 The investigation of queue discipline systems with sessional service, 2007 – 2010</li> <li>▪ Project Ф06P-220 The method of multilevel modelling with use of methods of molecular dynamic 2006 – 2008</li> <li>▪ Project Ф08P-172 Definition of fundamental diffuse parameters of internode atomosilicon, 2008 – 2010</li> </ul>

### 1.3 Bio-informatics Laboratory



<b>Research Organisation</b>	Bio-informatics Laboratory (National Academy of Science of Belarus - United Institute of Informatics Problems)
<b>Contact person:</b>	Dr Igor E. TOM
<b>Email:</b>	<a href="mailto:tom@newman.bas-net.by">tom@newman.bas-net.by</a>
<b>Phone:</b>	+375(17) 284-21-53, 284-20-92, 284-02-40
<b>website</b>	<a href="http://uiip.bas-net.by/eng/lab_b.html">http://uiip.bas-net.by/eng/lab_b.html</a>
<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	<p>The main scientific direction of the Laboratory of Bioinformatics is the development of intelligent methods of knowledge discovery in data and creation of information technologies for systems of registration, storage, remote access, search, processing and delivery of data.</p> <p>The laboratory's main fields of research are:</p> <ul style="list-style-type: none"> <li>• Development of classification models for medicine and other applications on the basis of intelligent methods of data processing and analysis (neural network models, genetic algorithms, fuzzy logic, hybrid models and others).</li> <li>• Development of information technologies for decision support with application in medicine and other areas.</li> <li>• Development of databases and client applications, based on Internet/Intranet-technology «client Web server database server».</li> <li>• Creation of techniques for modelling crash-test for support safety drivers</li> </ul>
<b>Collaboration interest</b>	<ul style="list-style-type: none"> <li>▪ Intelligent methods of data processing and analysis</li> <li>▪ Information technologies for decision support systems with application mainly in medicine (bio-informatics);</li> <li>▪ Databases and client applications, based on Internet/Intranet-technology.</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ Information-analytical system (IAS) for registration of heterogeneous laboratory, clinical and personal information of patients, remote data access and delivery, statistical and intelligent data analysis for selection of adequate therapy intensity of acute childhood leukaemia. (<a href="http://itk1.bas-net.by/b522/index.htm">http://itk1.bas-net.by/b522/index.htm</a>). IAS is applied in Belarusian Research Centre for Paediatric Oncology &amp; Haematology, Ministry of Health of Belarus.</li> <li>▪ "Electronic Register Database of Childhood Leukaemia" – SQL-electronic register database of childhood leukaemia with access scheme "client-server" and "client-Web-server-database server".</li> <li>▪ The medical-oriented software «ProAPF» implements the complex of multivariate statistical and intelligent neural network methods for dimension reduction of clinical-laboratory data and their pre-processing, selection of most significant prognostic risk factors, verification of selected combinations, definition of its dynamics during treatment, prediction of inductive therapy results, identification of patient risk group according to individual profile of prognostic risk factors.</li> <li>▪ The medical-oriented software «HYBRID» is intended for the decision of the patient classification tasks (assigning to risk groups), provides the generation of several subsets of compact and interpretable classification rules. Software «HYBRID» is applied to Belarusian Research Centre for Paediatric Oncology &amp; Haematology, Ministry of Health of Belarus.</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Computer-aided system of electronic depository of scientific proceedings is released in the editorial office of journal «Informatics» (<a href="http://depository.bas-net.by/EDNI/">http://depository.bas-net.by/EDNI/</a>) for automation of technological processes of collection, handle, storage, search and grant internet-access to the abstracts and full-text of scientific and technical articles of journal.</li> </ul>
<b>European or National Project Experience</b>	<p>At present, the Laboratory is involved in the following research projects:</p> <ul style="list-style-type: none"> <li>▪ ISTC Project #B-522 «Development of the computer-based system for prognostic risk factors analysis to select adequate therapy of childhood acute leukaemia.</li> <li>▪ Project of the National Program of Belarus in Fundamental Research: Project INFOTECH-11, Topic 2 “Methods of processing, analysis and classification of multivariate data”.</li> <li>▪ Project of the National Program of Belarus in Scientific-Technical Research «Development and practical application of information technology for diagnosis of children primary immunodeficiency on the basis of clinical and laboratory indices». Project is executed together with specialists from Belarusian Research Centre for Paediatric Oncology &amp; Haematology, Ministry of Health of Belarus.</li> <li>▪ Project of the National Program of Belarus in Scientific-Technical Research «Development and practical application in Belarus the information-analytical system of the account and planning of medical actions for coagulopathy patients». Project is executed together with specialists from Belarusian Research Centre for Transfusiology &amp; Haematology, Ministry of Health of Belarus.</li> </ul>
<b>Additional Information</b>	<p>Number of researchers: 8 (including 3 PhD)  Number of employees in total: 11</p>

## 1.4 Centre of Nanoelectronics and Novel Materials



<b>Research Organisation</b>	Centre of Nanoelectronics and Novel Materials (Belarusian State University of Informatics and Radioelectronics)
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<b>Address</b>	P. Browka 6, 220013 Minsk, Belarus
<b>Short description</b>	<p>The collective of the Centre of Nanoelectronics and Novel Materials are engaged in nanosize structures researches and development of the devices for micro- and optoelectronics on their basis more than 10 years. There is an experience of application of the research results to production. The team is equilibrium in highly qualified specialties dealing with both experimental researches, directed on development of new methods of nanostructured materials formation, and theoretical work and computer modeling of fundamental electronic and optical properties of nanosize structures. The main research areas of the Centre of Nanoelectronics and Novel Materials are:</p> <ul style="list-style-type: none"> <li>▪ charge transport in DNA-based devices</li> <li>▪ quantum computing</li> <li>▪ scanning probe nanotechnology</li> <li>▪ semiconducting silicides</li> <li>▪ silicon and germanium structures</li> <li>▪ silicon based optoelectronics</li> <li>▪ silicon quantum well devices</li> <li>▪ sol-gel processes</li> </ul>
<b>Collaboration interest</b>	<ul style="list-style-type: none"> <li>▪ silicon nanowires (theoretical simulation of fundamental electronic, optical and transport properties)</li> <li>▪ magnetic tunnel junctions and their related silicon based spintronics devices (theoretical simulation)</li> <li>▪ semi-conducting silicides (theoretical simulation of fundamental electronic, optical and transport properties)</li> <li>▪ refractory metal (Ti, W, Ta) nanoporous oxides and their applications (fabrication and characterization)</li> </ul>
<b>Main Achievements</b>	<p>Thermodynamical contribution into stability of silicon nanowires with different morphology and axes has been estimated and an explanation of experimentally observed features in growth orientations of such nanostructures with respect to diameter has been provided. On the basis of electronic and optical properties of silicon nanowires we have also suggested a possible scenario of photoluminescence process from nanostructured silicon. Influence of germanium on electronic and optical properties of silicon-germanium nanowires has been calculated.</p> <p>Structural, electronic and optical properties of all semiconducting silicides (<math>Mg_2Si</math>, <math>Ca_2Si</math>, <math>Ca_3Si_4</math>, <math>BaSi_2</math>, <math>CrSi_2</math>, <math>MoSi_2</math>, <math>WSi_2</math>, <math>MnSi_x</math>, <math>ReSi_{1.75}</math>, <math>\beta-FeSi_2</math>, <math>OsSi_2</math>, <math>Ru_2Si_3</math>, <math>Os_2Si_3</math>, <math>FeSi</math>, <math>RuSi</math>, <math>OsSi</math>, <math>Ir_3Si_5</math>) have been calculated in order to select direct gap compounds for optoelectronic applications compatible with the silicon technology. Metastable <math>Ca_2Si</math> and ternary <math>\beta-(FeOs)Si_2</math> are found to possess not only the direct nature of the gap, but high oscillator strength of the first direct transition. In the case of <math>Ca_3Si_4</math>, <math>CrSi_2</math>, <math>MoSi_2</math>, <math>WSi_2</math>, <math>MnSi_x</math>, <math>ReSi_{1.75}</math>, <math>\beta-FeSi_2</math>, <math>Ru_2Si_3</math> we have also estimated transport properties.</p> <p>An original technology of fabrication of refractory metals nanoporous oxides on a silicon surface is developed. It is based on the magnetron co-</p>



	<p>sputtering of aluminium and refractory metal (Ti, Nb, W) followed by porous electrochemical anodization of the composite film and selective etching of alumina. The pore walls sizes obtained are less than 10 nanometers that allows to increase essentially the area of an internal surface of porous structure in comparison with known analogues. The nanoporous oxide films with a thickness up to 5 <math>\mu\text{m}</math> were fabricated and studied.</p> <p>The model of spin-dependent current transfer in magnetic tunnel junctions (MTJ) and Si-Ge structures taking into consideration scattering mechanisms was developed. The calculations of current-voltage characteristic and tunnel magnetoresistance (TMR) were performed. Electrical equivalent circuit and topological design of memory unit based on the MTJ composed of CoFe/Al<sub>2</sub>O<sub>3</sub> (MgO)/Si/CoFe nanostructures were developed. The prototype of silicon integrated spintronic memory device on the base of structures investigated was designed and fabricated.</p> <p><b>Main recent publications</b></p> <ul style="list-style-type: none"> <li>▪ V.E.Borisenko, <i>Semiconducting Silicides</i> (Springer, Berlin, 2000)</li> <li>▪ V.E.Borisenko, S.Ossicini, <i>What is What in the Nanoworld. Second, Completely Revised and Enlarged Edition</i> (Wiley-VCH, Weinheim, 2008)</li> <li>▪ D. B. Migas, V. L. Shaposhnikov, V. E. Borisenko, Isostructural BaSi<sub>2</sub>, BaGe<sub>2</sub> and SrGe<sub>2</sub>: electronic and optical properties, <i>Phys. Stat. Sol. (b)</i> <b>244</b>(7), 2611-2618 (2007)</li> <li>▪ D. B. Migas, V. E. Borisenko, Tailoring the character of the band-gap in &lt;011&gt;- , &lt;111&gt;- and &lt;112&gt;-oriented silicon nanowires, <i>Nanotechnology</i> <b>18</b>(37), 375703 (2007)</li> <li>▪ S.K.Lazarouk, D.A.Sasinovich, V.E. Borisenko, Nanoporous oxides of refractory metals: fabrication and properties, <i>Phys. Stat. Sol. (c)</i> <b>5</b>(12), 3690-3693 (2008)</li> <li>▪ D.B. Migas, V.E. Borisenko, The role of morphology in stability of Si nanowires, <i>J. Appl. Phys.</i> <b>105</b>(10), 104316(6 pages) (2009).</li> </ul>
<b>European or National Project Experience</b>	<ul style="list-style-type: none"> <li>▪ Joint projects within FP5 (SMILE), FP6 (EMAC)</li> <li>▪ Projects within National Programs "Electronics" and "Nanotech" in 2001-2009</li> </ul>

## 1.5 Computer Systems and Pattern Recognition Laboratory



<b>Research Organisation:</b>	Computer Systems and Pattern Recognition Laboratory (Belarusian State University of Informatics and Radioelectronics)
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<b>Address</b>	P. Browka Str., 6, Minsk 220013 Belarus
<b>Short description</b>	<p>Computer Systems and Pattern Recognition Laboratory (CSPR Lab) is a scientific research unit of Computer Systems Department of Belarusian State University of Informatics and Radioelectronics.</p> <p>The laboratory's main areas of research activity are:</p> <ol style="list-style-type: none"> <li>1. signal and image processing,</li> <li>2. pattern recognition,</li> <li>3. satellite images processing and classification,</li> <li>4. criminal investigation automation,</li> <li>5. parallel computing,</li> <li>6. software development,</li> <li>7. telemetry system modelling,</li> <li>8. telemetry data intelligent processing and analysis.</li> </ol>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>• multi-spectral satellite images processing, segmentation and object classification</li> <li>• face recognition</li> <li>• processing the image of textile fibres and other micro-objects for criminal investigation</li> <li>• telemetry objects modelling and identification</li> <li>• image databases development</li> <li>• Parallel programming including MPI, CUDA, and FPGA implementation.</li> <li>• Integrated Circuit image processing</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>• Computer vision system for automatic TV-raster adjustment</li> <li>• Software for textile fibres processing for criminal investigation</li> <li>• Software for multi-spectral satellite images processing</li> <li>• Software for face tracking and recognition in people stream</li> <li>• Software for image compression, cataloguing and hierarchical handling</li> </ul>
<b>European or National Project Experience</b>	<ul style="list-style-type: none"> <li>▪ INTAS Belarus 97-2928,</li> <li>▪ Projects in National and joint Russian &amp; Belarusian Programs (e.g. Cosmos-SG, Cosmos-NT, Triada)</li> </ul>

## 1.6 Discrete Mathematics and Algorithmics Department



<b>Research Organisation:</b>	Discrete Mathematics and Algorithmics Department (Belarusian State University - Faculty of Applied Mathematics)
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<b>Address</b>	Nezavisimosti Ave., 4, 220030 Minsk, Belarus
<b>Short description</b>	The Department of Discrete Mathematics and Algorithmics is one of the leading departments of the Applied Mathematics and Computer Science Faculty of the Belarusian State University. The members of the department have a strong experience in combinatorial optimization, in elaborating combinatorial, scheduling and graph-theoretic tools for problems' optimization, in solving structural and algorithmical problems on graphs and hypergraphs as well as in constructing graph-theoretical and scheduling models connected with application-motivated optimization problems.
<b>Collaboration interests</b>	<p>The collaboration interests can include (but are not limited to):</p> <ul style="list-style-type: none"> <li>▪ elaborating on-line and semi on-line models and effective approximation algorithms for partitioning and bin packing problems;</li> <li>▪ solving scheduling problems with special constraints;</li> <li>▪ developing methods of describing and characterizing graphs with given restrictions on their local structure;</li> <li>▪ distinguishing reasonable classes of graphs, hypergraphs and other combinatorial objects which are well tractable algorithmically.</li> </ul> <p>The realization of the collaboration interests would lead to the development of effective approaches for solving discrete optimization and algorithmical problems which arise in manufacturing, telecommunication, network planning, and which can be formulated in terms of scheduling, graph and bin packing models.</p> <p>Areas of R&amp;D Collaboration can include (but are not limited to):</p> <ul style="list-style-type: none"> <li>▪ planning and control in manufacturing and service operations;</li> <li>▪ transportation and logistics;</li> <li>▪ communication network design;</li> <li>▪ routing and channel assignment in optical networks.</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>○ Various models for partitioning and bin packing problems with incomplete and partial information, in particular, semi-on-line multiprocessor scheduling with a given total processing time, are investigated.</li> <li>○ New methods of bunch classifications for multiprocessor scheduling problem with two stages (off-line and semi-on-line scheduling with decreasing processing times) are developed.</li> <li>○ New approximation algorithms and lower bounds for optimal solutions of the Asymmetric Maximum Travelling Salesman and Discrete Economic Order Quantity problems are proposed.</li> <li>○ The computational complexity and complexity of approximation for the Maximum Independent Set, Minimum Independent Dominating Set, and Maximum</li> </ul>

	<p>Induced Matching problems for some graph classes are investigated.</p> <ul style="list-style-type: none"> <li>○ Methods of describing and characterizing graphs with a prescribed local structure, in particular, hereditary and co-hereditary classes of graphs, are elaborated.</li> <li>○ Models and algorithms for the design of survivable WDM and TDM optical networks with general failure scenarios are proposed.</li> </ul>
<b>European or National Project Experience</b>	<p>Members of the department have a long-term experience of joint research on scheduling models and methods, structural and algorithmical problems on graphs and hypergraphs, designing on-line and semi on-line algorithms, in particular in the framework of the following INTAS projects carried out in the years 1998 – 2007:</p> <ul style="list-style-type: none"> <li>▪ «Special classes of graphs: representations, local properties, characterizations, algorithms» (Project INTAS-Belarus 97-0093; Co-ordinator: Prof. Dr. Andreas Brändstadt, University of Rostock, Germany),</li> <li>▪ «Scheduling and assignment models under uncertainty and real-time constraints with application to manufacturing, communication, computer-aided design and transportation» (Project INTAS 00-217; Co-ordinator: Prof. Dr. Jean-Marie Proth, INRIA, Metz, France),</li> <li>▪ «Scheduling for modern manufacturing, logistics and supply chains» (Project INTAS-Network 03-51-5501; Co-ordinator: Prof. Dr. Gerd Finke, University of Joseph Fourier, Grenoble, France),</li> <li>▪ «Developing combinatorial and graph theoretical methods with emphasis on discrete optimization» (Project INTAS 03-50-5975; Co-ordinator: Prof. Dr. Horst W. Hamacher, University of Kaiserslautern, Germany).</li> </ul>
<b>Additional information</b>	<p><b>Recent publications:</b></p> <ul style="list-style-type: none"> <li>▪ C.T. Ng, T.C.E. Cheng, V. Kotov, M.Y. Kovalyov, The EOQ problem with decidable warehouse capacity: analysis, solution approaches and applications, <i>Discrete Applied Mathematics</i> <b>157</b> (2009) 1806-1824.</li> <li>▪ M.S. Barketau, T.C.E. Cheng, C.T. Ng, V. Kotov, M.Y. Kovalyov, Batch scheduling of step deteriorating jobs, <i>Journal of Scheduling</i> <b>11</b> (2008) 17-28.</li> <li>▪ T.C.E. Cheng, H. Kellerer, V. Kotov, Semi-on-line multiprocessor scheduling with given total processing time, <i>Theoretical Computer Science</i> <b>337</b> (2005) 134-146.</li> <li>▪ H. Kellerer, V. Kotov, An approximation algorithm with absolute worst-case performance ratio 2 for two-dimensional vector packing, <i>Operations Research Letters</i> <b>31</b> (2003) 35-41.</li> <li>▪ Yu. Orlovich, V. Gordon, D. de Werra, On the inapproximability of independent domination in <math>2P_3</math>-free perfect graphs, <i>Theoretical Computer Science</i> <b>410</b> (2009) 977-982.</li> <li>▪ Yu. Orlovich, G. Finke, V. Gordon, I. Zverovich, Approximability results for the maximum and minimum maximal induced matching problems, <i>Discrete Optimization</i> <b>5</b> (2008) 584–593.</li> <li>▪ V. Gordon, Yu. Orlovich, F. Werner, Hamiltonian properties of triangular grid graphs, <i>Discrete Mathematics</i> <b>308</b> (2008) 6166-6188.</li> </ul>

## 1.7 High Performance Systems Laboratory



<b>Research Organisation</b>	High Performance Systems Laboratory (National Academy of Science of Belarus - United Institute of Informatics Problems)
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<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	<p>The main scientific direction of the Laboratory of High Performance Systems is the development of methods and components both mathematical and software for high performance computing systems with the parallel architecture.</p> <p>The laboratory's main areas of activity are:</p> <ul style="list-style-type: none"> <li>▪ development and creation of parallel algorithms for processing of aerospace maps with applying of heterogeneous information, computing and network resources;</li> <li>▪ designing and development of software system to realise the automatic dynamic parallelization;</li> <li>▪ creation of instrument environment of training to apply the parallel algorithms and technologies;</li> <li>▪ development of methods and tools for the solution of fundamental scientific and engineering problems with a wide field of application, which effective solution is possible only with usage of powerful (supercomputer) computing resources. This tools could be used in: using: weather and climate forecast, image processing and recognition, construction of solid state devices, genetics of human, transport problems, gas dynamics, efficiency of systems of combustion of fuel, reconnaissance of oil and gas, recognition and speech synthesis, system for processing of radar and optical signals, system for automatic recognition and selection of the objects in real time.</li> </ul>
<b>Collaboration interests</b>	<p>Laboratory is interested in collaboration with Research Centres and software development companies for creation and using of high-performance complexes. The laboratory is mainly interested in the following areas:</p> <ul style="list-style-type: none"> <li>▪ creation of modern computing technologies and methods of parallel programming in order to increase the efficiency of the solution of fundamental scientific and applied problems;</li> <li>▪ technologies of creation of parallel algorithms and programs adapted effectively to the greater spectrum of architectures of high performance complexes;</li> <li>▪ research and development of methods of software parallelization in multiprocessor (distributed) systems;</li> <li>▪ programming and execution environment for computational grids.</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ System and application software for SKIF supercomputer family;</li> <li>▪ Parallel Image Processing Library (PIPL);</li> <li>▪ Family of software systems for solving large-scale problems in distributed computing environment;</li> <li>▪ Development of distribution software middleware for the national grid segment;</li> <li>▪ Creation of the operational centre of the national grid network.</li> </ul>
<b>European or National</b>	At present, the laboratory is involved in the following research projects:

<b>Project Experience</b>	<b>National projects:</b> <ul style="list-style-type: none"><li>▪ National Supercomputer and Grid Project - SKIF-GRID;</li><li>▪ National space program in processing of satellite images;</li></ul> <b>International projects:</b> <ul style="list-style-type: none"><li>▪ "BalticGrid-II" project: Combination of Collaborative projects &amp; Coordination and support actions in SEVENTH FRAMEWORK PROGRAMME;</li></ul>
<b>Additional Information</b>	<ul style="list-style-type: none"><li>▪ Number of researchers: 8 (including 1 PhD)</li><li>▪ Number of employees in total: 9</li></ul>

## 1.8 Image Processing and Recognition Laboratory - "RAMONAK" R&D Team



<b>Research Organisation:</b>	Image Processing and Recognition Laboratory - "RAMONAK" R&D Team (National Academy of Science of Belarus - United Institute of Informatics Problems)
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<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	<p>The R&amp;D Team "RAMONAK" of the UIIP-NAS specialises in the development and implementation of image processing and analysis software applications for medicine, geodesy and nanotechnology.</p> <p>During last decade the R&amp;D team has carried out successfully several State scientific projects. Additionally, since 2004, the Researchers of the Team have participated in more than 5 European projects.</p> <p>Currently the team develops medical data analysis in order to create a system for preliminary diagnostics and prediction of diseases by radiological images, characteristics measurement technology for nanostructure definition and histology image analysis software for monitoring of oncology diseases.</p>
<b>Collaboration interest</b>	<p>The main area of R&amp;D collaboration of the Team is the analysis and processing of images (2D, 3D, Multi-sliced (layered) /multi-spectral) including:</p> <ul style="list-style-type: none"> <li>▪ medical images</li> <li>▪ GIS Images</li> <li>▪ technical distance control</li> <li>▪ images for nano-science</li> <li>▪ measurement of image objects</li> </ul>
<b>Main Achievements</b>	<p>The R&amp;D Team "RAMONAK" has developed several software packages and methods for medical applications including the analysis of: cyto-histological images, computer tomography (CT), ultrasound (US), endoscopy, Magnetic thin films and raster satellite images.</p> <p>The "RAMONAK" team has also developed:</p> <ul style="list-style-type: none"> <li>▪ a Library of 2D object measurement;</li> <li>▪ algorithms for cells and nuclear images segmentation;</li> <li>▪ algorithms for colour histological images enhancement;</li> <li>▪ a method for histological image analysis on multi optical magnification;</li> <li>▪ algorithms for calculation of new characteristics for thyroid nuclear descriptions;</li> <li>▪ formalization of volume cancer description by CT-images;</li> <li>▪ a method for thyroid gland analysis based on joint processing of histological and ultrasonic images;</li> <li>▪ an automatic segmentation of thyroid gland from US Images;</li> <li>▪ a technology of detection and calculation of topology features for 3D objects</li> <li>▪ an automatic segmentation of vertebrae from CT Images.</li> </ul>
<b>European or National Project Experience</b>	The R&D Team "RAMONAK" of the Image Processing and Recognition Laboratory has participated in several projects under the Belarusian State programme and in EU projects (INTAS, ISTC and FP6) both as a

	<p>developer partner and as a researcher partner.</p> <p>During the past 5 years the R&amp;D team has participated in following EU funded projects:</p> <ul style="list-style-type: none"><li>▪ INTAS 323 "Data mining algorithm incubator" (2000-2003)</li><li>▪ INTAS 00-626 "MEDICAL IMAGE MINING: Theoretical Foundation and Technological Aspects"; (2005-2007)</li><li>▪ INTAS 04-77-7036 "Disclosing intrinsic relations between ultrasonic and histological images for improving thyroid cancer diagnosis after the Chernobyl Reactor Accident" (2005-2007)</li><li>▪ FP6 Marie Curie Action TRANSFER OF KNOWLEDGE "Combined study of nanostructured magnetic materials" (2004 – 2009) (as researcher)</li><li>▪ ICTS B1489 Automatization of diagnostics and prognosis of mediastinal and retroperitoneal tumours in children based on analysis of radiological images (2008-2010 y.)</li></ul> <p>The team has also participated in 7 projects under the Belarusian State programme (4 of them have already finished and while the rest 3 are in progress) for medical and satellite image processing.</p>
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## 1.9 Information Analysis Systems Laboratory



<b>Research Organisation</b>	Information Analysis Systems Laboratory (National Academy of Science of Belarus - United Institute of Informatics Problems)
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<b>website</b>	-
<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	The main scientific direction of the Laboratory is the investigation and development of data representation models along with algorithms and methods of multidimensional data pre-processing and analysis in corporate information systems.
<b>Collaboration interests</b>	The Laboratory is interested in collaboration with research institutions in the fields of fundamental and applied scientific research and development. The main areas of interest are: <ul style="list-style-type: none"> <li>▪ Telemedicine technologies;</li> <li>▪ EHR systems development and integration;</li> <li>▪ Development of traffic control algorithms, city traffic modelling and control systems.</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ Medical information analytical system on the EHR basis;</li> <li>▪ Radiological information system of medical institution;</li> <li>▪ Automated control system of the city road traffic;</li> <li>▪ Medical information analytical systems for dispensaries and stomatological clinics;</li> <li>▪ Digital fluorography distributed telemedicine system;</li> <li>▪ Distributed corporate system for electronic documents exchange for regional healthcare institutions on the Internet basis.</li> </ul>
<b>European or National Project Experience</b>	<p>At present, the laboratory is involved in the following <b>national research projects</b>:</p> <ul style="list-style-type: none"> <li>▪ Development of distributed information system of electronic exchange of medical documentation and data within healthcare corporate network on the basis of Internet/Intranet portals;</li> <li>▪ Development of national automated information and analytical system "Trauma";</li> <li>▪ Development of the technology, soft- and hardware for creation of the national automated telemedicine system of unified electronic consultations;</li> <li>▪ Development and creation of the technology of the decentralized control and soft- and hardware complex to provide a remote monitoring and control of peripheral elements of city traffic system.</li> </ul> <p><b>International projects:</b></p> <p>ISTC projects supported financially by EU such as, ISTC B-736 and ISTC B-522, aiming at development and creation of expert information analysis system.</p>
<b>Additional Information</b>	<p>Number of researchers: 5 (including 2 PhD)</p> <p>Number of employees in total: 17</p>

## 1.10 Information Hiding and Data Protection Laboratory



<b>Research Organisation:</b>	Information Hiding and Data Protection Laboratory (Belarusian State University - Faculty of Radiophysics and Electronics - Department of Intelligent Systems and Networks)
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<b>Short description</b>	The Information Hiding and Data Protection Laboratory is a research group led by Dr Iryna Chvarkova that is located in Department of Intelligent Systems at Belarusian State University. The Laboratory's main directions of research are: <ul style="list-style-type: none"> <li>▪ audio watermarking;</li> <li>▪ images watermarking;</li> <li>▪ steganography in multimedia areas;</li> <li>▪ lexical steganography.</li> </ul>
<b>Collaboration interests</b>	The main areas of R&D Collaboration are: <ul style="list-style-type: none"> <li>▪ methods and algorithms development for empty container analysis for usage capability;</li> <li>▪ methods and algorithms development for hidden data detection and localization based on container type features.</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ Increase detection effectiveness of steganographic channel via appreciating frequency difference of neighbouring sample values.</li> <li>▪ New frequency based steganographic algorithms for data hiding in images that are robust to standard compression algorithms.</li> </ul>
<b>European or National Project Experience</b>	2005 – 2010: National R&D Research project (reg. number 20061227) "New Algorithms Development that Allows to Increase Detection Effectiveness of Steganographic Channel"
<b>Additional Information</b>	The Laboratory has a good experience in steganographic algorithms development, modification, coding and optimization. The Laboratory's personnel have developed 'Steganography Processor 1.0' software package which is a test tool for all the Laboratory's concepts and algorithms. This test tool is continually upgraded with new algorithms and modifications. Laboratory Members have high experience in international workshops participation and public statements. Members of Laboratory publish up to 7 new scientific articles every year.

## 1.11 Information Protection Laboratory



<b>Research Organisation</b>	Information Protection Laboratory (National Academy of Science of Belarus - United Institute of Informatics Problems)
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<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	<p>The <b>Laboratory of Information Protection</b> of UIIP-NAS was established in 1996. The main scientific directions of the Laboratory are the development of information protection methods, development and deployment of grid, cloud and supercomputer infrastructures and development of medical information systems.</p> <p><b>Information security</b></p> <p>Within last five years a number of essential theoretical results were obtained in the Laboratory in the field of methodology of estimation and protection of information technologies, including:</p> <ul style="list-style-type: none"> <li>▪ The method of efficiency estimation of products protection and systems of information technologies (it was recognised as the best scientific result of 2000 in the field of fundamental research in UIIP). Unlike traditional methods of risks estimation, the offered method takes into account the dynamics of system processes and reliability both hardware and software means of protection;</li> <li>▪ The method of synthesis and analysis of the requirements of IT products and systems security, which is based on a quantitative estimation of efficiency of the decision of separate tasks of protection and their categories.</li> </ul> <p><b>Medical information security</b></p> <p>The researchers of the Laboratory of Information Protection conducted a number of R&amp;D projects in the framework of the Belarusian State R&amp;D Programs to produce computer hardware-software systems (HSS) for collection, processing and recognition of ultrasound, X-ray and radionuclide medical images and computerized control systems (CCS) for medical centres on the basis of the electronic personal medical case history.</p> <p>HSS for collection, processing and recognition of medical images are intended for comprehensive computerization of medical centres activity to provide efficient work with medical data and images, making medical conclusions, files of attended patients storage, data archives maintenance and diagnosis statistic reports. CCS for medical centres on the basis of the local area network of the centre is designed for all-round computerization of the medical institution: creation and control of information traffics, collection, analysis and processing the information of medical charts of the patients, their personal medical case histories and other documents, also on processing the information of material and devices supply.</p>
<b>Collaboration interests</b>	<p>The Laboratory's main areas of R&amp;D collaboration are:</p> <ul style="list-style-type: none"> <li>▪ methodological basis, methods and tools of information protection;</li> <li>▪ criteria and estimation of protection efficiency for IT products and systems;</li> <li>▪ security of grid, cloud and supercomputer infrastructures;</li> <li>▪ medical information systems and telemedicine;</li> </ul>

<p><b>Main Achievements</b></p>	<ul style="list-style-type: none"> <li>▪ quality and structural testing of the software.</li> </ul> <p><b>Applied Projects</b></p> <ul style="list-style-type: none"> <li>▪ Custom UNICORE-based distribution for Linux and Windows-based sites (development of a UNICORE-based software product, which includes installation packages and a complete set of technical documentation).</li> <li>▪ UNICORE billing system (development of billing system for national Grid network).</li> </ul> <p><b>Achievement in Information security</b></p> <p>The methodologies, models, techniques, normative-methodical documents, technical decisions, systems and devices which have been developed in the laboratory were used in scientific-research works designed for:</p> <ul style="list-style-type: none"> <li>▪ The State Centre of Information Security in the Administration of President of Belarus ;</li> <li>▪ National bank of the Republic of Belarus;</li> <li>▪ "BELARUS BANK".</li> </ul> <p><b>Achievements in Medical information security</b></p> <p>The Laboratory in collaboration with other research institutions of Belarus produced and implemented HSS for collection and processing medical images in more than 30 medical centres of Belarus, such as State Clinical Psychiatric Hospital, Brest Regional Clinical Hospital, Minsk Regional Clinical Hospital, Minsk City Clinical Hospital N5, Minsk City Clinical Hospital N9, State Radiation Medicine Clinic, Minsk City Emergency Medical Care Hospital, Belarus' Frontier Troops Hospital N1, and others.</p> <p>The developed CCS for medical centres on the basis of electronic personal case history is being used in the Main Military Clinical Hospital of Belarus, in the polyclinic of BelOMO Production Amalgamation (Minsk) and Belarusian Consultative Endocrinology Centre. The database of the above-mentioned medical centres comprises comprehensive information about more than 50,000 patients including more than 1 000,000 diagnostic images.</p> <p>In carrying out the above mentioned projects, the employees of the Laboratory have acquired a great experience in hardware-software integration of computer systems with the following medical diagnostic equipment of various foreign producers: X-ray units including digital ones; ultrasound scanners including colour Doppler mode; CT, MRI, gamma cameras; microscopes for various purposes and others. These computer systems have been certified by the Belarusian Ministry of Health.</p>
<p><b>European or National Project Experience</b></p>	<p>At present, the Laboratory is involved in the following research projects:</p> <ul style="list-style-type: none"> <li>▪ EU FP7 project "Baltic Grid Second Phase" (BalticGrid-II) (2008-2010);</li> <li>▪ EU FP7 project "GEANT 3" (2009-2013);</li> <li>▪ Nordic Data Grid Facility project "Northern Europe Cloud" (2009-2010).</li> <li>▪ Program of the Union State of Russia and Belarus "SKIF-GRID" (2007-2010);</li> <li>▪ Program of the Union State of Russia and Belarus "Cosmos-NT" (2008-2011);</li> </ul> <p>The scientists of the Laboratory actively take part in the joint Belarusian-Russian supercomputer program "SKIF" and execute the project "Development and creation of a hardware-software cardio logical system based on supercomputer modules for investigation of microcirculation state of cardiovascular system by a bio microscopy method.</p>
<p><b>Additional Information</b></p>	<p>Number of researchers: 18 (4 PhD) Number of employees in total: 28</p>

## 1.12 Information support of scientific research Department



<b>Research Organisation</b>	Information support of scientific research Department (National Academy of Science of Belarus - United Institute of Informatics Problems)
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<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	The main activity of the "Department of Information support of scientific research" of UIIP-NAS is the development of architecture and management of data bases and language interfaces, functioning technologies of corporative library-information systems for automated work of scientific and technical libraries on basis of Internet-technologies. Additionally the Department is specialized in the development of data bases, Web-portals, digital libraries and information search systems.
<b>Collaboration interest</b>	<ul style="list-style-type: none"> <li>▪ Library management systems</li> <li>▪ Management information systems (MIS)</li> <li>▪ Digital libraries</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ System for organization and maintenance on-line library catalogues, which was implemented in National library of Belarus, Central scientific library NAS of Belarus, Presidents library of the Republic of Belarus, Republics scientific-technical library, National books chamber of Belarus;</li> <li>▪ System for the corporative cataloguing publications and maintenance of the electronic union catalogue libraries of Belarus, which was placed in experimental operation on the base of National library of Belarus;</li> <li>▪ System for the maintenance of national data base of authority records, which was placed in operation on the base of National library of Belarus;</li> <li>▪ System for the maintenance and on-line Internet access to national data base of industrial property objects (inventions, utility models, industrial designs, trademarks) on the base of National center of intellectual property;</li> <li>▪ System for remote Internet-order and electronic delivery of documents on the base of CSL NAS of Belarus Center of Internet-access to foreign scientific electronic publications</li> </ul>
<b>European or National Project Experience</b>	The Department has participated in 4 projects for "Digital Libraries" under the NAS of Belarus programme
<b>Additional Information</b>	Number of researchers: 8 Number of employees in total: 13

## 1.13 Information Technologies and Means of Telecommunications Laboratory



<b>Research Organisation</b>	Information Technologies and Means of Telecommunications Laboratory (Yanka Kupala State University of Grodno - Industrial Electronics Department)
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<b>Address</b>	22, Ozheshko Street, Grodno, 230023, Belarus
<b>Short description</b>	<p>The main scientific activity direction of the Laboratory is the completion of fundamental programs and application researches and projects (financed by the Ministry of Industry, the Ministry of Education, the National Academy of Sciences of the Republic of Belarus and foreign funds) in the following areas:</p> <ul style="list-style-type: none"> <li>• computer-based systems of technological preparation of production; systems of the design-technological documentation;</li> <li>• CAD systems;</li> <li>• automatic control systems;</li> <li>• systems of analysis, storage and access to the information in Intranet/Internet networks;</li> <li>• systems analysis and informational analytical systems;</li> <li>• database /data warehouse systems.</li> </ul>
<b>Collaboration interest</b>	<ul style="list-style-type: none"> <li>▪ the integrated methodology of the information systems development;</li> <li>▪ methodological basis, methods and tools of the system analysis, system engineering, project management, reengineering; <ul style="list-style-type: none"> <li>• GRID infrastructure.</li> </ul> </li> </ul>
<b>Main Achievements</b>	"Development of the regional distributed segment of GRID network SKIF for support of educational, research and industrial activities of energetic and machinery enterprises (GRODNO-GRID)"
<b>European or National Project Experience</b>	<ul style="list-style-type: none"> <li>▪ Grant № K96-0929 EuroAsia Fund for the period 15.02.96 no 31.05.97, project "Regional Centre Creation of Hypermedia Information Network World Wide Web at the Communication Centre of Grodno University"</li> <li>▪ "Creation of electronic archive on WWW and FTP servers with the development of depository of inquiry and research information on the DB servers"</li> <li>▪ "Development of the integrated model on data and documents depository on WEB basis"</li> <li>▪ "Development of the algorithms and methods of information system reliability provision"</li> </ul>
<b>Additional Information</b>	Number of researchers: 7 (2 PhD)

## 1.14 Mathematical Cybernetics Laboratory



<b>Research Organisation</b>	Mathematical Cybernetics Laboratory (National Academy of Science of Belarus - United Institute of Informatics Problems)
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<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	<p>The main scientific direction of the Laboratory of Mathematical Cybernetics (LMC) is the development of methods for solving optimization problems and investigation of their computational complexity. Within the main scientific directions of LMC there are the following areas of interests:</p> <ul style="list-style-type: none"> <li>▪ scheduling theory and production planning and scheduling;</li> <li>▪ combinatorial optimization and extremal graph problems;</li> <li>▪ complexity of combinatorial problems;</li> <li>▪ approximate algorithms;</li> <li>▪ decomposition methods in mathematical programming</li> </ul> <p>Obtained results are used in the decision support systems, flexible manufacturing systems, automated production systems, computer-aided design and banking.</p>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>▪ Operation research and discrete optimization</li> <li>▪ Decision making in extreme situation</li> <li>▪ Scheduling theory and production planning and scheduling;</li> <li>▪ Combinatorial optimization and extremal graph problems;</li> <li>▪ Complexity of combinatorial problems;</li> <li>▪ Approximate algorithms;</li> <li>▪ Decomposition methods in mathematical programming</li> <li>▪ 3D modelling</li> <li>▪ Processing and analysis of images</li> <li>▪ Bio and medical informatics</li> <li>▪ Applications of supercomputers.</li> </ul>
<b>Main Achievements</b>	<p>The laboratory has participated in the following Applied Projects:</p> <ul style="list-style-type: none"> <li>▪ Algorithms and software for the clearing of mutual debts of enterprises (versions: without the usage of bank credits and with engaging credits).</li> <li>▪ Algorithms and software for finding a variant for the clearing of interbank payments with maximum resulting sum.</li> <li>▪ Algorithms and software for finding an optimal sequence in an automated plating lines.</li> <li>▪ Algorithms and software for definition of optimal packaging of articles different namings in rectangular tare of miscellaneous types and sizes.</li> </ul>
<b>European or National Project Experience</b>	<p>At present, the LMC is involved in the following research projects:</p> <ul style="list-style-type: none"> <li>▪ Project of the National Program of Belarus in Fundamental Research: "Theoretical Foundations of the New Information Technologies" (together with the Laboratory of Operations Research);</li> <li>▪ The Project supported by the Belarusian Fund for Fundamental Research: "Mathematical methods for optimal scheduling with variable parameters and resource constraints".</li> <li>▪ INTAS Project "Scheduling and assignment models under uncertainty</li> </ul>

	<p>and real-time constraints with application to manufacturing, communication, computer-aided design and transportation" (in cooperation with the Laboratory of Operations Research of UIIP, INRIA (France), University of Technology of Troyes (France) and University of Osnabrueck (Germany)</p>
<b>Additional Information</b>	<ul style="list-style-type: none"><li>▪ Number of researchers: 26 (including 6 PhD and 3 DSc)</li><li>▪ Number of employees in total: 29</li></ul> <p>LMC has got good science contacts with a number of reputable European science centres, including Utrecht University (Netherlands), CNRS (France), Imperial College London (Great Britain), Malnnheim Institute (German).</p>



## 1.15 Mathematical Cybernetics Laboratory - “Combinatorics and Scheduling” R&D Team



<b>Research Organisation:</b>	Mathematical Cybernetics Laboratory - “Combinatorics and Scheduling” R&D Team (National Academy of Science of Belarus - United Institute of Informatics Problems)
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<b>Address</b>	Surganov 6, 220012, Minsk, Belarus
<b>Short description</b>	<p>The R&amp;D team “Combinatorics and Scheduling” of the UIIP-NAS specialises in the theory and applications of combinatorics and scheduling. The main application areas:</p> <ul style="list-style-type: none"> <li>▪ decision support systems for optimal design, supply and production planning and control,</li> <li>▪ logistics,</li> <li>▪ image processing,</li> <li>▪ protein structures,</li> <li>▪ optimizing bank operations,</li> <li>▪ Dispatching multiprocessor tasks.</li> </ul>
<b>Collaboration interest</b>	<p>The R&amp;D Team “Combinatorics and Scheduling” aims to participate in the EU ICT-programmes dealing with optimization of software design, technological and production processes, material, finance and information flows, computer scheduling and computer tasks dispatching, power management in computer controlled technical devices, computers and data-centres.</p> <p>The main areas of R&amp;D collaboration are:</p> <ul style="list-style-type: none"> <li>▪ Decision support systems (DSS) for optimal design, production planning and control</li> <li>▪ Logistics</li> <li>▪ Dispatching tasks in multiprocessor systems, data-centres and computer networks</li> <li>▪ Power management in computer controlled devices, computers and data centres</li> <li>▪ Optimization of management activities at institutional and governmental levels</li> <li>▪ Mathematical tools for determination of protein structures</li> <li>▪ Mathematical tools for image processing</li> </ul>
<b>Main Achievements</b>	<p>The main Team’s achievements are the development of:</p> <ul style="list-style-type: none"> <li>▪ DSS for operation scheduling with applications in space and aircraft building industries.</li> <li>▪ DSS for optimal design of machine parts.</li> <li>▪ Mathematical tools and software for dispatching multiprocessor tasks.</li> <li>▪ Mathematical tools and software for optimizing bank operations.</li> <li>▪ Combinatorial algorithms and software for image processing.</li> <li>▪ Combinatorial algorithms and software for protein structure determination.</li> </ul>
<b>European or National Project Experience</b>	UIIP Team “Combinatorics; and Scheduling” was involved as a research partner in 5 projects sponsored by the International Association for Promotion of Cooperation with Scientists from Former Soviet Union (INTAS), 2 projects sponsored by the International Science and

	<p>Technology Centre (ISTC) and several projects sponsored by Belarusian and other country's research funds.</p> <ul style="list-style-type: none"> <li>▪ ISTC Projects No. B-104-98 "Optimization methods and tools for design, control and management in engineering systems" and No. B-986 "Models, methods and tools for decision support of designing and scheduling for the engineering systems with parallel and series structure". UIIP Team "Combinatorics and Scheduling" acted as the main research body.</li> <li>▪ INTAS Projects INTAS-93-257 and INTAS-93-257-ext "Constraint scheduling: Mathematical models, algorithms, and applications", INTAS-96-0820 "Discrete optimization problems in scheduling and computer-aided design", INTAS 00-217 "Scheduling and assignment models under uncertainty and real-time constraints with application to manufacturing, communication, computer-aided design and transportation", INTAS 03-51-5501 "Scheduling for modern manufacturing, logistics and supply chains". UIIP Team "Combinatorics and Scheduling" was involved as the main eastern partner.</li> </ul>
<p><b>Additional Information:</b></p>	<p>Number of researchers: 12                  Number of employees in total: 17</p> <p>The R&amp;D team has designed and implemented Software for space and aircraft building industry, medical and governmental institutions, integrated circuits design companies.</p>

## 1.16 Measuring Information Systems Laboratory



<b>Research Organisation:</b>	Measuring Information Systems Laboratory (Belarusian State University - Faculty of Radiophysics and Electronics)
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<b>Short description</b>	<p>The Laboratory is specialised in the development of electronic measuring instruments and systems and software design for:</p> <ul style="list-style-type: none"> <li>▪ measuring equipment (high &amp; low level);</li> <li>▪ industrial automatisation ;</li> <li>▪ process monitoring, data bases, etc.</li> </ul> <p>The laboratory has also a long experience in:</p> <ul style="list-style-type: none"> <li>▪ Automatisatation of industrial measuring &amp; testing laboratories, test &amp; control equipment.</li> <li>▪ Testing and certification of electronic and measuring devices.</li> </ul>
<b>Collaboration interests</b>	<p>Hardware &amp; Software design</p> <ul style="list-style-type: none"> <li>▪ Custom Hardware design of electronic devices &amp; systems, including analogue, digital &amp; interface electronics (sensors, preamplifiers, amplifiers, ADC, DAC, PLD, DSP, ARM, MCU, interface controllers, wireless, power &amp; battery management, etc).</li> <li>▪ Custom Software design: <ul style="list-style-type: none"> <li>○ "High level" programs for OS Windows &amp; Linux on C#, C++, visual C, etc.;</li> <li>○ "Low level" programming of PLD, DSP, ARM, MCU, interface controllers/</li> </ul> </li> <li>▪ Code-sign of Hardware &amp; Software.</li> <li>▪ Collaboration for joint production.</li> </ul>
<b>Main Achievements</b>	<p>The laboratory has 12 pattern approval certificates of measuring instruments (digital oscilloscopes, ADCs, waveform generators, logic analysers, acoustic noise &amp; vibration meters &amp; analysers, time measuring systems). Most of designed measuring instruments - in the active production; the winners of more than 30 medals &amp; diplomas on international exhibitions.</p>
<b>European or National Project Experience</b>	<p>The laboratory has signed:</p> <ul style="list-style-type: none"> <li>▪ Two (2) international contracts with ScienLab Electronic Systems GmbH, Bochum, Germany for design of electronic measuring systems for automotive area.</li> <li>▪ Three (3) international contracts with Aeromash company, Moscow, Russia – design of electronic measuring systems for avionic area.</li> </ul> <p>Additionally, the Laboratory has:</p> <ul style="list-style-type: none"> <li>▪ Long-term international scientific collaboration &amp; projects with Universities of Bohum &amp; Wuppertal, Germany.</li> <li>▪ Long-term international scientific collaboration &amp; projects with Space Research Institute, Moscow, Russia.</li> <li>▪ More than 40 National projects in area of measuring electronics &amp; automatisatation.</li> </ul>

## 1.17 Nano-Optics Laboratory



<b>Research Organisation</b>	Nano-Optics Laboratory (National Academy of Science of Belarus - B. I. Stepanov Institute of Physics)
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<b>Address</b>	Nezavisimosti Ave. 68, Minsk 220072 Belarus
<b>Short description</b>	Laboratory for Nano-Optics deals with physics and technology of novel nanostructures for applications in opto-electronics and information technologies, incl., e.g. optical interconnects, optical and electro-optical switching and modulation, luminescent materials incl. those for white LED development and biomedical applications (in medical diagnostics), plasmonic structures for ultrasensitive molecular analysis as well as for solar cells improvements.
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>▪ Ultrafast semiconductor optical switches for 1.5 micrometer range;</li> <li>▪ White luminophores compatible with LEDs to improve performance of currently existing white LEDs;</li> <li>▪ Plasmonic nanostructures structures for ultrasensitive analysis (e.g. in medical diagnostics);</li> <li>▪ Plasmonic nanostructures and antireflecting coatings for thin film solar cells;</li> <li>▪ Novel photonic components based on nanostructures, e.g. metal-semiconductor-dielectric filters for CCD matrices.</li> </ul>
<b>Main Achievements</b>	<p>The main Laboratory's achievements are in the fields of laser physics and technology, optical science and technology, micro- and opto-electronics, plasma physics and material processing, including:</p> <ul style="list-style-type: none"> <li>▪ Internationally recognized research grade (about 2000 citations)</li> <li>▪ Multidisciplinary expertise (from optoelectronic components to medical diagnostics)</li> <li>▪ Experience in EU projects, networking, and cooperation</li> </ul>
<b>European or National Project Experience</b>	<p>Laboratory for Nano-Optics participated in 2 EU FP6 projects as a partner. B.I.Stepanov Institute of Physics participated totally in 4 EU FP6 projects.</p> <p><b>EU projects:</b></p> <ul style="list-style-type: none"> <li>▪ European Network of Excellence "PHOREMOST" (FP6 prioject): "Nanophotonics to realize molecular scale technology", (more than 30 parnters), 1 award for the best paper within the Network of Excellence.</li> <li>▪ SA-NANO (FP6 project): "Self-assembly of colloidal nanostructures".</li> </ul> <p><b>Other projects:</b></p> <ul style="list-style-type: none"> <li>▪ "Mesoscopic light emitters, switches and transformers" – International Science and Technology center project with FIAT Research Centre as EU collaborator;</li> <li>▪ "Novel approaches for opto-electronic and microwave components"</li> </ul> <p><b>National project</b></p> <ul style="list-style-type: none"> <li>▪ "Nanostructured porous materials for backlight enhancement in LCD displays" – National project</li> </ul>

## 1.18 Quantum Optics Laboratory



<b>Research Organisation</b>	Quantum Optics Laboratory (National Academy of Science of Belarus - B. I. Stepanov Institute of Physics)
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<b>Address</b>	Nezavisimosti Ave. 68, Minsk 220072 Belarus
<b>Short description</b>	<p>Laboratory of quantum optics of B.I.Stepanov Institute of Physics was founded in 1994. The laboratory is specializing in experimental investigations on:</p> <ul style="list-style-type: none"> <li>▪ Optical fibre systems for quantum key distribution;</li> <li>▪ Physical random number generators;</li> </ul> <p>Moreover, the laboratory provides theoretical research on:</p> <ul style="list-style-type: none"> <li>▪ Nano-diamond devices and protocols for quantum information processing;</li> <li>▪ Protocols and security proofs for quantum cryptography systems;</li> <li>▪ Random number production and testing;</li> <li>▪ Photonic band-gap structures with single emitting centres</li> <li>▪ Entanglement-based quantum information processing</li> </ul>
<b>Collaboration interest</b>	<p>Quantum cryptography. Quantum information processing. Single-photon sources. The laboratory's main areas of R&amp;D collaboration are:</p> <ul style="list-style-type: none"> <li>▪ Quantum optics (squeezed and other non-classical states of light, single atoms and molecules in different environment, quantum fluctuations of laser emission)</li> <li>▪ Quantum information and quantum cryptography</li> <li>▪ Quantum computers</li> <li>▪ Control of stochastic processes in laser systems</li> <li>▪ NV centers in diamond for quantum information applications</li> </ul>
<b>Main Achievements</b>	<p>The laboratory's main achievements are:</p> <ul style="list-style-type: none"> <li>▪ New solid-state systems for quantum processing and quantum computers. NV centers as a base for quantum information devices.</li> <li>▪ New protocols for quantum cryptography.</li> <li>▪ New algorithms for physical random number generators. (Patent protected)</li> <li>▪ Fibre-based quantum key distribution system.</li> </ul>
<b>European or National Project Experience</b>	<p>At the moment the laboratory takes part in a number of local state scientific projects concerning:</p> <ul style="list-style-type: none"> <li>▪ detection of noise signals and operation of stochastic processes in bi-stable lasers;</li> <li>▪ optical methods of controlling spin states of single impurity colour centres;</li> <li>▪ creation of hybrid daylight system using solar tubes and LED;</li> <li>▪ investigation of colour centres properties located nearby nanostructured diamond surfaces for solid state quantum computers and single photon sources;</li> <li>▪ quantum correlation complex system of various dimension;</li> <li>▪ methods and algorithms of generation of random number sequence in space-separated points using quantum cryptography technology</li> </ul> <p>The laboratory participated in the 6th European Framework Project EQUIND "<a href="http://www.equind.org/">http://www.equind.org/</a>" (2007-2009) "Engineered Quantum Information in Nanostructured Diamond" as a collaborator.</p>

## 1.19 Radiophysics Department



<b>Research Organisation:</b>	Radiophysics Department (Belarusian State University - Faculty of Radiophysics and Electronics)
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<b>Address</b>	4, Nezavisimosti av., 220030 Minsk, Belarus,
<b>Short description</b>	<p>The research team includes 10 specialists in statistical analysis and modelling, familiar with Hidden Markov Models, neural networks and support vector machines, 5 specialists in digital signal processing, 5 specialists in software design and developing. The team has serious experience in international projects fulfillment, it includes 10 Ph.D. and 1 Professor.</p> <p>The Department's research activities are:</p> <ul style="list-style-type: none"> <li>▪ Development of software and hardware systems for digital processing of signals of different physical nature of information transfer systems, monitoring, diagnosis;</li> <li>▪ Synthesis and study of composite radio materials, structures, systems, devices with new electrodynamic properties.</li> </ul>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>▪ Audio processing and indexing</li> <li>▪ Speech recognition and synthesis</li> <li>▪ Music recognition</li> <li>▪ Audio semantic analysis</li> <li>▪ Biomedical signal processing</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ New methods for audio indexing are developed based on "key-event" technology</li> <li>▪ Methods and algorithms for vocal tract pathology detection are developed</li> <li>▪ Speech recognition and keywords search algorithms are developed based on HMM and SVM</li> </ul>
<b>European or National Project Experience</b>	<p>The Department has participated in the following projects:</p> <ul style="list-style-type: none"> <li>▪ ISTC B-95</li> <li>▪ ISTC B-705</li> <li>▪ ISTC B-1375</li> </ul>
<b>Additional Information</b>	The scientists of the department have very good experience in software development for Win32 and Unix platforms using C++

## 1.20 Real-Time Digital Systems Laboratory



<b>Research Organisation</b>	Real-Time Digital Systems Laboratory (Belarusian State University of Informatics and Radioelectronics)
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<b>Address</b>	P. Brovky, 6 Minsk, 220013, Belarus
<b>Short description</b>	<p>The laboratory has a long experience (about 30 years) in the field of digital signal processing, (algorithms and applications), designing new parallel architecture and software of real-time digital systems, DSP processors application to digital signal processing and real time control. Emphasis is placed upon the synergy and interaction between algorithms, architecture, and software. Currently the research activities of the Laboratory includes fundamental work and problem-oriented projects in measurement and communication areas, especially in the field:</p> <ul style="list-style-type: none"> <li>• very low bit-rate speech and audio coding;</li> <li>• combined system of echo cancellation and noise reduction for mobile communication systems</li> <li>• robust speech recognition (a hybrid approach: hidden Markov models and neural nets);</li> <li>• digital filter banks: uniform and nonuniform filter banks; paraunitary filter banks based on the quaternionic numbers.</li> </ul>
<b>Collaboration interest</b>	<p>Problem-oriented projects in measurement and communication areas, especially in the field:</p> <ul style="list-style-type: none"> <li>▪ very low bit-rate speech and audio coding;</li> <li>▪ combined system of echo cancellation and noise reduction for mobile communication systems;</li> <li>▪ robust speech recognition</li> <li>▪ digital filter banks</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ Speech/audio coding; speech processing (analysis, synthesis, noise reduction) for mobile communications;</li> <li>▪ hearing aids;</li> <li>▪ biometric (multimodal biometric authentication: theory, algorithms and rapid prototyping on the reconfigurable computing structures);</li> <li>▪ reconfigurable computing for multimedia applications</li> </ul>
<b>European or National Project Experience</b>	<ul style="list-style-type: none"> <li>▪ 1995: Research project "On the Design of High Performance Processors for Digital Signal Processing", Reg. No 4.7541.8 (University of Applied Physics, Mittweida, Germany)</li> <li>▪ 1995-1996: Tempus Tacis: project "Karrierezentrum - Ost", No P_JEP-02367-95 (Germany, France)</li> <li>▪ 2008-2010: Research project "Parametric audio/speech coder systems: synthesis and analysis methods, implementation based on the reconfigurable computing platform" No To8MC-040 (University of Alcala (Alcala de Henares-Madrid, Spain), Belarussian Fund for Fundamental Research</li> </ul>
<b>Additional Information</b>	<p>Number of researches: 14 (including 8 PhD and 1 DSc)</p> <p>The Research Laboratory "Real-Time Digital Systems" is interested in collaboration with all Research Institutes and groups. The laboratory has got good science contacts with a number of reputable European science centres: University of Alcala (Spain); Aachen university of technology (RWTH), Germany; University of Wuppertal (Germany); University of Applied Physics, Mittweida, Germany; we collaborate with university of China: Shanghai university and Zhejiang University of Technology, Institute of Computer Engineering and Telecommunications</p>

## 1.21 Systems Dynamics and Mechanics of Material Laboratory



<b>Research Organisation:</b>	Systems Dynamics and Mechanics of Material Laboratory (Belarusian National Technical University)
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<b>Address</b>	Ave Independence, 65, 220013 Minsk, Belarus
<b>Short description</b>	<p>The Laboratory of Systems Dynamics and Mechanics of Material of BNTU was established in 1990. The main activity of the laboratory is the theoretical investigation and computer modelling in different fields of system theory, mechanics, physics and social dynamic including:</p> <ul style="list-style-type: none"> <li>▪ Dynamics of systems and mathematical modelling of social processes</li> <li>▪ Dynamical Systems</li> <li>▪ Non-Euclidean model of deformation and fracture</li> <li>▪ Gauge theory of defects</li> <li>▪ Distribution of cracks and the theory of dislocations</li> <li>▪ Dynamics and stability of deformation processes</li> <li>▪ Computer simulation of solid mechanics based packages ANSYS, LS-DYNA, NASTRAN, DEFORM 3D, ABACUS</li> <li>▪ Regular and stochastic dynamics and wave propagation in inhomogeneous media</li> <li>▪ Sensors and actuators based on nanostructured materials and structures</li> <li>▪ Hierarchical approach to modelling of nanomaterials and nano-based quantum-mechanical integration and continuous models</li> <li>▪ Biomechanics</li> </ul> <p>The laboratory has developed different computer methods and packages, modern analytical approximation.</p>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>▪ Solid mechanics (especially, non-linear aspects),</li> <li>▪ FEM calculations,</li> <li>▪ molecular systems modelling,</li> <li>▪ high-performance systems,</li> <li>▪ grid-infrastructure,</li> <li>▪ social dynamic modelling</li> </ul>
<b>Main Achievements</b>	<p><u>Scientific:</u></p> <ul style="list-style-type: none"> <li>▪ hierarchical modelling of social systems;</li> <li>▪ application of non-standard analysis to society description;</li> <li>▪ Finslerian representation of solid mechanics;</li> <li>▪ nano-materials and MEMS ab-initio modelling;</li> <li>▪ methods of quantum systems description development.</li> </ul> <p><u>Infrastructures:</u></p> <ul style="list-style-type: none"> <li>▪ cluster purchasing and working in European grid.</li> </ul>
<b>European or National Project Experience</b>	BalticGRIDII of FP7, NATO grant, international program SKIF-GRID, Triada, Mechanics, Nanotech, several national grants in fundamental research
<b>Additional Information</b>	The Belarusian National Technical University (BNTU) is leading institution in higher technical education of the Republic of Belarus, offering advanced



	<p>educational programs in Engineering, Technology, Natural Sciences, Architecture, and Business Administration. The University is of high potential of professor staff which includes about 1600 members teaching more than 25.000 students. BNTU provides 60% of the country's needs for the engineering staff in mechanical engineering, 90% – in power engineering and metallurgy, 70 % – in building and construction, 90% – in architecture. The main research staff and activities are concentrated at the Research Division of BNTU (NICH BNTU) consisting of 44 scientific laboratories and units. NICH BNTU is independent research organization. The basic directions of its scientific investigations are:</p> <ul style="list-style-type: none"><li>▪ resource saving technology in mechanical engineering, material sciences, metallurgy, construction, power engineering;</li><li>▪ automobile and tractor construction, transport communications;</li><li>▪ city planning and road construction;</li><li>▪ telecommunication and computer facilities;</li><li>▪ instrument-making;</li><li>▪ industrial ecology.</li></ul> <p>NICH BNTU activities in IT area include solution of problems of the development of systems and technologies improving productivity of information flow processing in local and corporate networks; investigation and development of hardware, software and middleware means of information protection; network communication protocols; information technologies for application in power engineering and construction; software for the automated solution for costs of manufacture processes. Laboratory DSiMM belongs to NICH BNTU.</p>
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## 1.22 Technical Analysis of the Financial Markets Laboratory



<b>Research Organisation:</b>	Technical Analysis of the Financial Markets Laboratory (Belarusian State University - Faculty of Radiophysics and Electronics – Department of Intelligent Systems and Networks)
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<b>Address</b>	4, Nezavisimosti av., 220030 Minsk, Belarus
<b>Short description</b>	The Technical Analysis of the Financial Markets Laboratory is a research group led by Dr Siarhei Tsikhanenka that is located in Department of Intelligent Systems at Belarusian State University. The Laboratory's research activities include: <ul style="list-style-type: none"> <li>▪ neural network based technical analysis of the financial markets;</li> <li>▪ averages based technical analysis of the Financial Markets;</li> <li>▪ complex technical analysis algorithms development</li> </ul>
<b>Collaboration interests</b>	The main areas of R&D Collaboration are: <ol style="list-style-type: none"> <li>1. Averages based Adaptive Automatic Analysis System development;</li> <li>2. Neural networks based algorithms development for financial trends patterns recognition;</li> <li>3. Real time analysis of the financials trends with automatic decision making.</li> </ol>
<b>Main Achievements</b>	Averages Based Model of the Adaptive Automatic Analysis System of the Financial Markets.
<b>European or National Project Experience</b>	October 2009: Participation in the Workshop at Belarusian Economic Research Institute 'Forecasting Activities and Governmental Regulation of the Social and Economic Progress'
<b>Additional Information</b>	The Laboratory has a good experience in algorithms for technical analysis development and models building. Laboratory's scientists have an experience in international collaboration and public statements. Members of Laboratory publish to 8 new scientific articles every year.

## 2 Private ICT R&D Enterprises

## 2.1 Automation-2000, LLC



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<b>Short description</b>	<p>Automation-2000 was founded in 1997. The company aims to promote cutting-edge management information systems and technologies for energy sector of Belarus and the CIS countries. In the past few years, company's experts have developed and implemented hardware and software solutions for data collection, dispatching, real-time control and management, monitoring energy consumption, digital reference books, automation of document management, and statistical and financial accounting.</p> <p>Additionally, the company develops:</p> <ul style="list-style-type: none"> <li>▪ light-emitting-diode systems for telemetrical mapping information on mnemonic mosaic diagrams at the dispatchers' units;</li> <li>▪ intellectual remote control stations of various data capacity for both new and upgraded auxiliary power stations;</li> <li>▪ software and hardware enable monitoring of the condition of the utilities equipment, controlling the equipment, as well as providing means for monitoring consumption of multiple energy resources.</li> </ul>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>▪ Development and implementation of automated technological process control systems (ATPCS) and energy monitoring systems.</li> <li>▪ Turn-key solutions, which include design, installation, setup, warranty and post-warranty services</li> </ul>
<b>Main achievements</b>	<p>The company's products have been implemented in all energy supply systems of Belarus and in a number of energy supply systems of Ukraine. Automation-2000 had developed:</p> <ul style="list-style-type: none"> <li>• the KONUS-2000 automated electric power monitoring system;</li> <li>• the KVANT-2000 software package for graphical presentation and processing of telemetrical information on electric power monitoring and management, and creation of ATPCS.</li> <li>• A set of automated workstations (Dispatcher WKS, Telemechanic WKS, Power Engineer WKS, Protection Engineer WKS) provides effective tools, which were commissioned by and developed in close cooperation with experts from various divisions and services of Belenergo, GPO, the government energy agency</li> </ul>
<b>European or National Project Experience</b>	-

## 2.2 AVEST



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<b>Short description</b>	<p>AVEST, ZAO is one of the leading companies in the market of the Republic of Belarus in the sphere of information technologies. Currently, the activities of the company covers the following key areas:</p> <ol style="list-style-type: none"> <li>1. software solutions for encryption information protection, electronic digital signature, public key infrastructure for electronic document management system protection in large corporations, state institutions, etc., comprising net traffic protection, strong authentication, VPN.</li> <li>2. assistance in office software development (electronic document management system, electronic archive, client-bank systems);</li> <li>3. integration, secure use and application of encryption systems developed by Avest, ZAO</li> <li>4. software development for bookkeeping and resource management, enterprise management systems with or without encryption;</li> </ol>
<b>Collaboration interests</b>	<ol style="list-style-type: none"> <li>a. Encryption systems development, namely applied research, development and analysis of encryption algorithms, secure data transfer protocols, secure use of encryption procedures and the methodology of their application.</li> <li>b. Implementation and licensing for information protection in the Republic of Belarus, including fundamental and applied research in this area, with the objective to enter the CIS and other international markets.</li> </ol>
<b>Main achievements</b>	<p>AVEST has created a number of products for cryptographic protection of electronic documents of any complexity:</p> <ul style="list-style-type: none"> <li>• Cryptographic AVEST CSP - Extension of cryptographic core system Microsoft Windows (developed in accordance with the specification of Microsoft Crypto API), which allows the use of cryptographic algorithms certified by the State Centre for Information Security under the President of the Republic of Belarus (GTSBI) all applications Microsoft Windows. Currently Cryptographic AVEST CSP. This Cryptographic Service is the only in the Republic of Belarus.</li> <li>• A set of software for the organization of public key infrastructure (PKI) - Center for Digital Certificates, Registration Center, personal manager certificates</li> <li>• AvCSPBase crypto driver comprises AvCSP Base v 1.0, a certified tool for electronic digital signature and encryption.</li> <li>• "Proizvodstvo" software system and implementation of enterprise management systems for bakery and printing industries</li> </ul>
<b>European or National Project Experience</b>	-

## 2.3 BelHard Group



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<b>Short description</b>	<p>BelHard Group focuses on the development and implementation of innovative information technologies and is a partner of over 20 companies abroad and 5,000 companies within its home country.</p> <p>Its main area of activity is the development and delivery of software products, including MIS, PCS, CAD, web-site design, search optimization, information security products, training in use of hardware and software, IT consulting and business consulting, and other activities related to the IT sector</p>
<b>Collaboration interest</b>	<p>BelHard Group offers mutually beneficial cooperation to professional teams and individuals. The company is looking for:</p> <ul style="list-style-type: none"> <li>• Experience exchange with companies that strive to deliver competitive goods and services to the global market.</li> <li>• Software development companies to join efforts in implementing projects on a long-term mutually-beneficial basis.</li> <li>▪ Cooperation with centres that provide training and certification services for IT sector.</li> </ul> <p>The company's main areas of interest are:</p> <ul style="list-style-type: none"> <li>▪ Enterprise information management systems</li> <li>▪ Content management systems</li> <li>▪ Customer relationship management (CRM)</li> <li>▪ Intranet/Extranet</li> <li>▪ Payment and billing systems</li> <li>▪ Rich web applications (web portals, e-learning solutions, online marketplaces and auctions, web CMS)</li> <li>▪ Flash/Flex Programming</li> <li>▪ QA and Software Testing Services</li> <li>▪ Mobile Application Development</li> <li>▪ Third Party Integration</li> <li>▪ Legacy System Reengineering</li> <li>▪ Technical Support &amp; Maintenance</li> <li>• Custom Software Design &amp; Development</li> </ul>
<b>Main Achievements</b>	<p>Some of the accomplished application development outsourcing projects:</p> <ul style="list-style-type: none"> <li>▪ Construction: <a href="#">EPROC application</a>.</li> <li>▪ Banking: <a href="#">Cash management solution</a>, Solution for financial services.</li> <li>▪ Governmental: <a href="#">Document circulation system</a>, <a href="#">Provisional Expenses Calculation System</a>, <a href="#">Public Procurement Automation</a>, <a href="#">Insurance Claims worksheet automation</a>.</li> <li>▪ Health: World Health Organization Medical Aid for Children, suffered from Chernobyl disaster through development and implementing the Telemedicine.</li> <li>▪ Publishing: <a href="#">Contract management system</a>, <a href="#">CD/ DVD publishing application</a>.</li> <li>▪ Mobile: <a href="#">GPS application porting</a>, <a href="#">Pocket PC functionality enhancement</a>, <a href="#">MMS application development outsourcing</a></li> <li>▪ Telecom: <a href="#">ERP application development outsourcing</a>, <a href="#">Centralized</a></li> </ul>

	<p><a href="#">network patches management</a>, <a href="#">Making people closer via web conferencing</a>.</p> <ul style="list-style-type: none"> <li>▪ Energy: <a href="#">Automated electricity metering system</a>, <a href="#">Solution for corporate resources integration</a></li> <li>▪ Law Enforcement: Aipsin Antidrug System Dadabase JUREXPERT-Database for lawyers</li> </ul>
<p><b>European or National Project Experience</b></p>	<ul style="list-style-type: none"> <li>▪ World Health Organization: Medical Aid for Children, suffered from Chernobyl disaster through development and implementing the Telemedicine. Russian Devence Export (Rosoboronexport) AIPSIN Antidrug System- joint development of BelHard Group and Central Customs Laboratory of Belarus,</li> <li>▪ Cash Management System Internet-based automated and centralized cash management used in a number of leading European Banks.</li> <li>▪ Customer Care Solution The project development is outsourced by Hewlett Packard © Russia where the end client is a large GSM operator.</li> <li>▪ Content Distribution Management System This media content distribution management system is designed as a part of our long-term IPTV project for the world’s leading online TV network.</li> </ul>

## 2.4 Belsoft-Borlas Group



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<b>Short description</b>	<p>BelSoft-Borlas group is a part the Borlas Consulting Group which is a leading Russian IT and e-Business consulting company. The company was founded in 2006 in Minsk, by Russian and Belarusian IT leaders BORLAS and BELSOFT.</p> <p>BelSoft-Borlas group utilizes expertise and experience gained by the both founding companies during more than 14 years on the IT market:</p> <ul style="list-style-type: none"> <li>▪ large-scale comprehensive business automation projects,</li> <li>▪ offshore software development and</li> <li>▪ systems integration projects.</li> </ul> <p>With highly skillful software development staff and consultants in Management Information Systems, Belsoft-Borlas Group services its customers by providing a creative and cost effective array of IT solutions from concepts through implementation to businesses in the United States, Eastern and Western Europe, Russia and Belarus.</p>
<b>Collaboration interes</b>	<p>Belsoft-Borlas Group invites medium-size and large companies that are interested in information technologies outsourcing (ITO) to cooperate in promoting our services on the markets of Western Europe and the U.S.</p> <p>The company focuses in the following areas:</p> <ul style="list-style-type: none"> <li>▪ Application Development, Management and Re-engineering;</li> <li>▪ Quality Assurance and Testing;</li> <li>▪ Systems Integration;</li> <li>▪ Enterprise Application Integration (EAI);</li> <li>▪ Business Intelligence and Data Warehousing;</li> <li>▪ Enterprise Portals and Mobile access;</li> <li>▪ Packaged Applications</li> <li>▪ Configuration, Implementation and Customization of Oracle E-Business Suite</li> </ul>
<b>Main Achievements</b>	<p><b>Business strategy:</b> Development of comprehensive services in export-oriented software development for medium-sized and large companies of Russia, Western Europe, and the US. Setting up a center for module expansion development on the platform of ERP system of Oracle E-Business Suite. Diversification of the client base. Continuous efforts to increase clients' satisfaction from using BelSoft-Borlas Group's services.</p> <p>BelSoft-Borlas Group delivers its services through two major models: project-based model and the Offshore Dedicated Center (ODC) model.</p> <p>Oracle E-Business Suite services constitute a special group. Oracle E-Business Suite is a fully integrated, comprehensive suite of business applications for the enterprise, which allows a more effective enterprise management, including recourse management, client interaction, service delivery, manufacturing, order delivery, payments management and other challenges of running a business within the same information system, the same architecture, and the same information space.</p>
<b>European or National Project Experience</b>	Belsoft-Borlas group delivered <b>IT Outsourcing solutions</b> to more than 30 customers in the USA, Western Europe, South-East Asia, including Best Group, Target, Datacon, G.O.D., Ectas and many others.



	<p>Borlas Consulting group has more than 50 completed projects of the Oracle e-Business Suite <b>implementation</b> both for the Russian and CIS countries customers. Among the customers of Borlas Consulting group there are Svyazinvest and interregional media companies, OJSC Vimplecom, RAO UES of Russia, OJSC Magnitogorsk Iron and Steel Works, PJSC Khartsyzsk Tube Works, OAO United Metallurgical Company, OJSC SeverStal, JSC Sukhoi Company, JSC Vanino Port, JSC Uralkali, JSC Sibur Holding, JSC EuroChem, AO Mosenergo etc</p>
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## 2.5 Belmicrosystems



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<b>Short description</b>	<p>The "Research &amp; Design Center "Belmicrosystems is a subsidiary of the State "Integral" Research &amp; Production Corporation. Almost all ICs produced by the Corporation as well as semiconductor devices and technologies for their manufacturing have been designed at the Belmicrosystems possessing both advanced design methods and up-to-date technological processes.</p> <p>Research &amp; Design Center "Belmicrosystems has a 30 year experience in designing integrated microcircuits and semiconductor devices; it is one of the biggest design centres in Eastern Europe. It is capable to do the developments in all topical trends in semiconductor electronics. Staff consists of 300 persons, including 12 doctors on science, 190 design engineers and process design engineers. Highly qualified personnel, up-to-date equipment and software allow the creation of the most complicated products within a short period of time. The availability of the modern design centre equipped with powerful work stations allow to develop the program packages of own design and to perform designing the custom integrated circuits within short time.</p>
<b>Collaboration interest</b>	<ul style="list-style-type: none"> <li>▪ Technological processes based on CMOS, Bipolar, BiCMOS, DMOS, BCDMOS and IGBT techniques</li> <li>▪ Developments of microcircuits and semiconductor electronics</li> <li>▪ implementation of software of the Mentor Graphics and Cadence companies for IC designing and Silvaco company for technological designing</li> <li>▪ Services of physical and chemical researches</li> <li>▪ Testing and certification of import element base on conformity to special requirements of the customer</li> </ul>
<b>Main Achievements</b>	About 80-90 new IC's projects of various applications are designed and put into production yearly for the customers from Belarus
<b>European or National Project Experience</b>	<p>Research &amp; Design Center "Belmicrosystems" is the state production enterprise of the Ministry of Industry of Belarus and is directed mainly on the microelectronic technology development, designing and producing the IC for the needs of national customers. Also the Center has contracts on production of IC after the orders of some companies of South East region: China, India, Korea, Japan. They are restricted to spend the resources for fundamental scientific projects but have the great potential in production of high quality special IC and digital devices after the orders of national and foreign companies.</p> <p>Each such IC's development could be considered as the national project in: memory IC chips, microcontrollers, drivers, peripheral ICs, TV and Audio ICs, liquid crystal displays, packages for ICs, etc</p>

## 2.6 Computer Research Institute “NIIEVM”



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<b>Address</b>	M. Bogdanovicha str., 155 220040, Minsk Belarus
<b>Short description</b>	<p>Computer Research Institute “NIIEVM” is a State Military-Industrial Committee (SMIC) lower organisation and a leading enterprise in the republic of Belarus in the field of computer aids producing. CRI “NIIEVM” is a leading enterprise in the SMIC system in supplying with Internet network services. CRI “NIIEVM” carries on developments in the sphere of computers during 50 years.</p> <p>The Instityute’s main activity directions are:</p> <ul style="list-style-type: none"> <li>▪ supercomputers;</li> <li>▪ personal computers, including PC for operation in severe environment, secure, portable;</li> <li>▪ mainframe computers of special and general purpose, including mobile computers with IBM S/390 architecture;</li> <li>▪ local computer networks of various types, program-technical means and teleprocessing systems;</li> <li>▪ computer software;</li> <li>▪ task-level system on the basis of computer engineering;</li> <li>▪ Job-dedicated machinery (point-of-sales, etc.);</li> <li>▪ automated checkpoints for underground, assisted tokens, magnetic cards and noncontact cards;</li> <li>▪ hybrid integrated circuit and MCM;</li> <li>▪ power supply systems, including uninterruptible;</li> <li>▪ systems and devices providing information security;</li> <li>▪ Internet technologies;</li> <li>▪ equipment testing (climatic, mechanical, computer security)</li> </ul>
<b>Collaboration interest</b>	<p>Computer hardware and software development.</p> <ul style="list-style-type: none"> <li>▪ Creation of computers of required architectures and classes for application in different fields and spheres, and also computer emulating systems on the basis of PC and its periphery; creation of supercomputer conformations, general and special purpose PCs and PCs operating in severe environment;</li> <li>▪ Creation of information processing systems in the interests of a user turnkey tasks, including special-purpose (movable);</li> <li>▪ Development and setting into operation at a Customer of various types of computer networks, including secured;</li> <li>▪ Development of information security systems;</li> <li>▪ User needs analysis, development of computerization projects of user tasks;</li> <li>▪ Development of application programs;</li> <li>▪ Development, production and supplying of special-purpose PC adapters (PCI, Compact PCI, mini PCI formats);</li> <li>▪ Testing software products, technical devices, data teleprocessing systems of any manufacturers, including monitoring of information confidentiality;</li> <li>▪ Development and application of projects for Internet connection and websites, consulting and methodical help on procedure of Internet technologies;</li> </ul>

	<ul style="list-style-type: none"> <li>▪ Consultations on computer engineering and software;</li> <li>▪ Development of power supply devices and systems, including uninterruptible power supply systems for computers and devices;</li> <li>▪ Development, supplying and application of management and access control to the objects, including turnstiles, trip pay and tunnel entry control systems;</li> <li>▪ Development of control and indicating protective equipment;</li> <li>▪ In-process measurement test branch;</li> <li>▪ Production and supplying of highly protected tokens (optical, magnetic, combined);</li> <li>▪ Development, production and supplying of point-of-sales and fiscal registrars;</li> <li>▪ Maintenance and repair of computers and PCs, including imported;</li> <li>▪ Designing and mounting of circuit board;</li> <li>▪ Equipment testing (climatic, mechanical, information security);</li> <li>▪ Production under Customer design documentation at the model shop;</li> <li>▪ Realization of unusable equipment, non-liquid goods.</li> </ul>
<b>European or National Project Experience</b>	<ul style="list-style-type: none"> <li>▪ Joint (with UIIP NASB) products: 6 types of supercomputers: clusters SKIF (PERVENETS, BM-5100, CARDIOLOGY, MYRIN, K-500, K-1000) and personal cluster SKIF-TRIADA;</li> <li>▪ 17 models of special protected personal computers</li> <li>▪ More than 20 special nets and systems which were adopted for more than 35 state Belarusian and Russian organizations;</li> <li>▪ Hardware and software complex for controlling of the means of payment, ticket manufacturing process, passengers entering, and technical service.</li> </ul>
<b>Additional Information</b>	<p><b>National Programmes:</b></p> <ul style="list-style-type: none"> <li>• Technical standardization of military production;</li> <li>• Head organization in Belarus of developing of technical and software facilities</li> <li>• Head provider in Belarus for electronic services for military industry</li> </ul> <p><b>International projects:</b></p> <ul style="list-style-type: none"> <li>• Joint Belarusian-Russian program «SKIF»</li> </ul>

## 2.7 Centre for Identification Systems



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<b>Address</b>	Akademicheskaya str. 15/2, 220072, Minsk, Belarus
<b>Short description</b>	<p>The Public enterprise "Centre for Identification Systems" is a developer and implementer of Identification and tracking systems. The Staff of the "Centre for Identification Systems" is well-qualified and counts 54 members. The Centre provides solutions and services concerning article numbering and automatic identification of products. The core activities of the Centre are associated with the development of the automated information systems, logistic systems and solutions for <b>e-business</b>. In addition to this the Centre provides the scientific-methodical support and coordination of all activities relating to advanced identification technologies carried out in Belarus.</p> <p>Along with the above mentioned, the Centre was officially authorized to perform database maintenance for products/goods marked with barcodes and Radio Frequency Identification codes (Depository) and to perform verification of barcodes and radiofrequency tags (RFID tags) including check of their legitimacy. All the services are provided in compliance with the international regulations and standards.</p>
<b>Collaboration interest</b>	Design and development of the automated identification systems, solutions for the RFID technology and other advanced identification technologies. Barcode identification and verification, logistics and solutions for e-business.
<b>European or National Project Experience</b>	<p>The main projects developed and launched by the Centre are:</p> <ul style="list-style-type: none"> <li>▪ Automated Information System (AIS) "Goods and Services". AIS "Goods and Services" is a basic technological environment for automation of business processes involved in economical and commercial relationships of Belarusian enterprises.</li> <li>▪ Automated Information System "Commodity Distribution Network of the Ministry of Agriculture and Food". AIS "CDN of the Ministry of Agriculture and Food" is designed to automate processes of delivery of agricultural products from manufacturers to consumers, to automate processes of control of product distribution on different segments of the agricultural market, to provide analytical processing of information for various governmental structures, including marketing departments of agricultural enterprises of Belarus.</li> <li>▪ Logistics Server of an Enterprise: Logistics Server of an Enterprise is a system performing supply chain event management by means of the radiofrequency identification (RFID).</li> <li>▪ Automated system "Analytical system for the Ministry of Foreign Affairs of Belarus". This project provides the following opportunities that are subject to the internal regulations and standards of the Ministry: automation and improvement of workflow, reduction of expenses that depend on the workflow, control of executive discipline and timely reporting.</li> </ul> <p>Currently the Centre for Identification Systems is developing the National system of product quality verification "Electronic product passport".</p>
<b>Additional Information</b>	<ul style="list-style-type: none"> <li>▪ Logistics Server of an Enterprise is a system performing supply chain event management by means of radiofrequency identification (RFID).</li> <li>▪ Being integrated in the enterprise management systems the Logistics</li> </ul>

	<p>Server of an Enterprise allows management of logistic processes concerning manufacturing, warehouse management, transportation management and security by means of the radiofrequency identification (RFID).</p> <ul style="list-style-type: none"><li>▪ The Logistics Server of an Enterprise improves the following logistics processes: JIT (Just In Time delivery), Tracking, Inbound &amp; Outbound Logistics.</li></ul>
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## 2.8 EXON IT LTD



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<b>Address</b>	17 Starinovskaya str., office 9H/1, 220056, Minsk, Republic of Belarus
<b>Short description</b>	<p><b>Exon IT</b> was founded in July 2008. The company is a part of Industrial Investment Company "Exon IBT Limited".</p> <p>Company's main line of activity is software development for banks and ERP-systems development and deployment, as well as development of various kinds of web-applications</p> <p>Additionally <b>Exon IT</b> provides software development, re-engineering solutions and ready-to-deploy business applications.</p>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>▪ Vectorization algorithm of line images using line segments and Bezier curve</li> <li>▪ Content management systems</li> <li>▪ Security of banking network systems</li> </ul>
<b>Main Achievements</b>	Network traffic surveillance system (co-development of security models)
<b>European or National Project Experience</b>	<ul style="list-style-type: none"> <li>▪ e-Import – business application which simulates the whole process of goods' income and expenditure</li> <li>▪ Online Tendering System – Web system that stands for tendering of various goods and services</li> <li>▪ Interbank Currency Exchange Client</li> </ul>

## 2.9 Information Society



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<b>website</b>	-
<b>Address</b>	Revolutsionnaya str. – 11, office 25, Minsk, Belarus
<b>Short description</b>	<p>The Non Government Organisation «Information Society» organization aims to facilitate the development of IT-industry and establishment of cutting-edge information and communication infrastructure, maximum possible application of ICT in all spheres of life in the Republic of Belarus. The organization incorporates more than 500 professionals representing the National Academy of Science, Belarusian State University, Belarusian State University of Informatics and Radioelectronics, Belarusian State Polytechnic Academy, Ministry of Foreign Affairs, Ministry of Communication, State Committee on Science and Technology, National assembly, Minsk City Executive Committee, Association of Belarusian Banks, Association Info-Park, company IBA, Belhard-Group and etc.</p> <p>The «Information Society» is built on close collaboration with institutions, organizations, enterprises and companies, whose representatives are members of the organization, as well as similar associations, international organizations and foundations.</p> <p>The main goals of NGO «Information Society» are:</p> <ul style="list-style-type: none"> <li>▪ promote maximum wide application of information and analytical technologies in all areas of activity;</li> <li>▪ attract the members of the Information Society to elaborate and carry out examination of laws, standards, other normative acts, and etc. in the area of information technologies;</li> <li>▪ participate in national, foreign and international program on the development of unified information space to facilitate the integration of the Republic of Belarus into it;</li> <li>▪ provide informational support for the activities of the governmental bodies and local administrative structures, managerial staff of the enterprises of all types of ownership and etc.;</li> <li>▪ promote access to national and world information resources for all categories of users.</li> </ul>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>▪ GS1 standards for goods identification in e-Commerce and import, export-oriented cooperation</li> <li>▪ Information systems for transparent administrative management and e-Government</li> <li>▪ Business process management systems for e-Business</li> <li>▪ Digital libraries and content management</li> <li>▪ Internet of Things and enterprise environments</li> <li>▪ Technology-enhanced learning</li> <li>▪ ICT for social inclusion</li> <li>▪ ICT enhanced learning and scientific and research cooperation</li> </ul>
<b>Main Achievements</b>	<p>NGO “Information society” is organizing and conducting the annual Belarusian Congress on Information and Communication Technologies – TIBO.</p> <p>It is involved in the development of the following strategic documents:</p> <ul style="list-style-type: none"> <li>▪ The National Program for the development of scientific and technical information in the Republic of Belarus.</li> </ul>



	<ul style="list-style-type: none"> <li>▪ The National Program for the Development of Scientific and Technical Information in the Republic of Belarus.</li> <li>▪ The National Policy of Informatization of the Republic for Belarus.</li> <li>▪ The Concept of the Unified Information Space for the Union of the Republic of Belarus and Russian Federation.</li> <li>▪ The Strategy of the Information Society Development in Republic of Belarus. (2009)</li> </ul>
<p><b>European or National Project Experience</b></p>	<ul style="list-style-type: none"> <li>▪ Analysis of scientific and research products and solutions of the South-East Asia and creation of the database for Belarusian innovations oriented to this market. (The World Bank )</li> <li>▪ The system for information and analytical support for co-operation between the city of Karlsruhe (Germany), Byalo-Podlyasko Regional Council (Poland) and Brest Regional Executive Committee (Belarus). <a href="http://www.tric.info">www.tric.info</a> . (TACIS Project)</li> <li>▪ Creation of the information system (“InfoMinsk”) to support and foster cooperation between Minsk citizens and governmental and administrative institutions. Started within the framework of TACIS for Belarus and continued as a part of the National Program “Electronic Belarus”. <a href="http://www.info.minsk.by">www.info.minsk.by</a></li> <li>▪ A project under the Nordic Council of Ministers’ Support Programme for NGOs in the Baltic Sea Region – ICT for the Elderly: New Chances for Social Inclusion and Democracy (running): introducing and teaching elderly people to use benefits of Internet technologies for active living and social inclusion.</li> </ul>

## 2.10 INIS-SOFT



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<b>Address</b>	51 Korolya Ulitsa, 5 <sup>th</sup> Floor, Office 3, Minsk, 220004, Belarus
<b>Short description</b>	<p>INIS-SOFT was established in 1994 and is specialized in the development of software applications for the educational systems of Belarus, the Russian Federation and Ukraine. Additionally, INIS-SOFT, specializes in:</p> <ol style="list-style-type: none"> <li>1. process automation in education,</li> <li>2. education quality monitoring system development,</li> <li>3. courseware development which enables didactical input for groups and individuals,</li> <li>4. administrative testing,</li> <li>5. maintaining detailed individual and group knowledge vacancies mapping,</li> <li>6. administering distributed teaching process; developing, testing and measuring practical and theoretical didactical databases in a variety of knowledge fields;</li> <li>7. teaching support for information science courses;</li> <li>8. pedagogical and curriculum recommendations for use of our didactical software in teaching process.</li> </ol> <p>The company serves more than 4,000 educational institutions in various regions of Belarus. Russia and Ukraine.</p>
<b>Collaboration interest</b>	<p>Development of</p> <ul style="list-style-type: none"> <li>▪ multilayer regional systems for management in education,</li> <li>▪ automated licensing and accreditation systems,</li> <li>▪ training and testing systems for a variety of industries,</li> <li>▪ automated psychological and social monitoring and diagnosis systems.</li> </ul>
<b>Main Achievements</b>	<p>INIS-SOFT has developed the following products/solutions:</p> <ol style="list-style-type: none"> <li>1. 21st Century Educational Institution Series</li> <li>2. A family of ParaGraf software technological complexes (STC) for automation of management in education which includes: <ol style="list-style-type: none"> <li>a. ParaGraf: 21st Century Educational Institution</li> <li>ParaGraf: College</li> <li>b. ParaGraf: Pre-school Institution</li> <li>c. ParaGraf: District</li> </ol> </li> <li>3. Movement, software modules for the ParaGraf:STC family.</li> <li>4. BiblioGraf, school and college library automation system</li> <li>5. School Tutor Series</li> <li>6. Teaching Monitoring bundled software</li> <li>7. ZNAK bundled software</li> <li>8. Test And Lessons Generator bundled software</li> </ol>
<b>European or National Project Experience</b>	-

## 2.11 Misoft NVP



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<b>Address</b>	P.O. Box 133, Minsk, 220013, Belarus
<b>Short description</b>	<p>MiSoft NVP, delivers, installs and provides maintenance for 1C-based automation systems, including advisory services on choice and upgradation of the existent systems, development and implementation of comprehensive MIS solutions, customer training at the authorized Center of Certified Training. For example, the "1C: Enterprise 8" platform allows setting up of a unified information system for enterprise management and record keeping in line with Belarusian, Russian and International standards.</p> <p>MiSoft NVP is also a Competence Center which provides the complete range of services, including enterprise management consulting, which derives from experience and comparative analysis of prior accomplished tasks with other companies. The company also attests to high competence of the staff; design, development, and promotion of industry solution and special-purpose replicable solutions for manufacturing companies; as well as provision of effective implementation and exploitation methodology.</p>
<b>Collaboration interest</b>	Development of standard and special 1C solutions for record keeping automation (book-keeping, manufacturing, trade, human resource) for companies of any legal type.
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ Company "MiSoft NVP" already develops more than 10 years and introduces typical options for programs 1C and specialised decisions for the users.</li> <li>▪ In this time on the basis of programs 1C the big enterprises (more than 100 workplaces), and the small firms which are engaged in specific kinds of activity have been successfully automated also.</li> <li>▪ The team comprises experts certified for every component of 1C: Enterprise 7.7. and 8, including 1C: Enterprise 8; Manufacturing Enterprise Management and IFRS.</li> </ul>
<b>European or National Project Experience</b>	-

## 2.12 System Technologies



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<b>Address</b>	Timiryazev St., 65A-308, 310, Minsk, 220035, Belarus
<b>Short description</b>	<p>System Technologies is one of the leading IT-companies in Belarus in the area of developing software solutions for many types of organizations including banks, industrial companies, insurance, and healthcare centres.</p> <p>System Technologies' major advantage is its team, which consists of more than 250 highly qualified professionals with unique experience in developing and implementing IT-solutions.</p> <p>System Technologies resolves a range of complicated and unique tasks, develops its products and services keeping in view the clients' needs and the long-term strategy of their business development. During the development of its solutions the company holds on to clear-cut principles of applying well tested and most effective industrial technologies.</p> <p>The major advantages of company's solutions are their functional completeness, high flexibility, reliability and openness of the technologies.</p>
<b>Collaboration interest</b>	<ul style="list-style-type: none"> <li>▪ Software products for the banking industry,</li> <li>▪ Software development and support services, consulting services and outsourcing.</li> <li>▪ SCT-CB Bank-Client system aimed at remote banking, which allows preparing, sending and processing difference types of documents (payment orders, payment requests, applications for purchase and sale of foreign currencies, information on settlements, other applications, etc.).</li> </ul>
<b>Main Achievements</b>	<ul style="list-style-type: none"> <li>▪ The <b>ST.BANK.IT integrated banking IT system</b> ensures reduced expenses and human effort and substantial reduction in data processing and transaction times through innovative IT solutions and modern technology. This approach helps organize and optimize information flows by making maximum use of centralization and integratability of our solutions.</li> <li>▪ Subsystem ST.BANK.IT. Electronic Banking: is an automated banking subsystem designed for complex services of banking clients, and ensuring reliable and efficient way to control their bank accounts from company's offices using modern telecommunication facilities.</li> <li>▪ Subsystem ST.BANK.IT. Analytics and Accounting: is an automated banking subsystem designed for centralization of calculation, storing the bank analytical and report information. It provides bank leaders, financial analysts and managers with necessary information of current importance in easy-to-use representation for activities of all trends.</li> <li>▪ Subsystem ST.BANK.IT. Credit document circulation is an automated banking subsystem designed for automation of bank's credit activity and ensuring the complex operations with credits</li> <li>▪ Subsystem ST.BANK.IT. Depository is an automated banking subsystem designed for automation of the depository registration of operations with securities</li> <li>▪ Subsystem ST.BANK.IT. CRM (Customer Relationships Management) is an automated banking subsystem designed for realization of corporative client-oriented politics of bank aimed at rise in benefit from clients, strengthening the loyalty of clients.</li> <li>▪ The <b>ST.DOCUMENTOOBOROT.IT integrated banking IT system</b> is a complex for resolving the problems of automation of electronic document transaction in banks and big corporations on the basis of the</li> </ul>

	<p>IBM Lotus Notes platform.</p> <ul style="list-style-type: none"><li>▪ ST.INSURANCE.IT equips you with high-performance tools to do all your insurance tasks quickly and ensure high quality. Complete integration of management, financial, fiscal and general accounting ensures efficient support to the developing business, helping improve the quality of management decisions and ability to compete.</li><li>▪ ST.LEASING.IT is a unified information database composed of documents, directories, reports and other types of objects. ST.LEASING.IT supports the entire transaction process, lease and loan follow-up and closure, transaction finance, payment accounting and control, contract and project status monitoring, report and forecast forms and many more.</li></ul>
<b>European or National Project Experience</b>	-

## 2.13 SoftClub



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<b>Address</b>	168/1, Nezavisimosti Ave., Minsk, 220141, Belarus
<b>Short description</b>	<p>SoftClub has been dealing in IT for banking and finance industries since 1993 developing and supporting solutions for 24 out of 31 Belarusian banks, banks in the CIS countries, as well as for a number of governmental bodies and companies in different industries of Belarus, rendering consulting services to banks in the CIS.</p> <p>High professionalism of company's people and their experience in automation of financial business processes gained over many years have resulted in SoftClub's high standing and trust among partners and clients. The distinctive feature of SoftClub approach is evolutionary implementation of modern technological solutions in accordance with the market requirements in order to reduce costs through building on the investments the company's client, which were made during previous stages of their automation.</p> <p>SoftClub has effectively implemented and applied ISO quality assurance system, which allows the company to provide software and services in accordance with the international standards.</p> <p>The world's and Russia's leading system software developers and system integrators are partners of SoftClub. Partnership with the industry leaders allows the company to offer the most up-to-date and innovative solutions.</p>
<b>Collaboration interests</b>	<ul style="list-style-type: none"> <li>• Promotion, localization, customization and support of software solutions in the CIS and neighbouring countries;</li> <li>• Outsourcing of any stage of software development;</li> <li>• Description and re-engineering of business processes when implementing customer systems in banks;</li> <li>• Outsourcing of customer applications support in the CIS.</li> </ul>
<b>Main Achievements</b>	<p>SoftClub has developed the following products/solutions:</p> <ul style="list-style-type: none"> <li>▪ SC-BANK NT, customer-centric online real-time 24x7 integrated core banking system</li> <li>▪ SC-ANALITICA, MIS Solution</li> <li>▪ SC-KASSA on-line, centralized retail banking system</li> <li>▪ SC-NDO AND MANAGEMENT, cash management in a bank</li> <li>▪ SC-ARCHIVE, centralized system for electronic archives management</li> </ul>
<b>European or National Project Experience</b>	-

### 3 Other sources of information

For further information on the ICT actors in Belarus you may contact the following organisations.

	Organisation	Contact details
1	Republican Centre for Technology Transfer	Web site: <a href="http://ictt.by">http://ictt.by</a> Tel.: +375 17 2841499 email: <a href="mailto:ictt@pochta.ru">ictt@pochta.ru</a> Address: 66-100, Nezavisimosti Ave., Minsk 220072, Belarus
2	Belarusian Innovation Fund	Web site: <a href="http://www.bif.ac.by/">http://www.bif.ac.by/</a> Tel.: +375 17 2840031 email: - Address: ul.Brovki 15, 220072 Minsk Belarus
3	Belarusian Republican Fundamental Researches Fund	Web site: <a href="http://fond.bas-net.by/">http://fond.bas-net.by/</a> Tel: +375 17 2949216 (physics, mathematics, informatics) +375 17 2842722 (technical sciences) email: <a href="mailto:fond@it.org.by">fond@it.org.by</a> Address: Nezavisimosti Av., 66, 220072, Minsk, Belarus
4	National Fund of Technical Legislative Acts of the Republic of Belarus	Web site: <a href="http://www.tnpa.by/">http://www.tnpa.by/</a> <a href="http://www.belgiss.org.by">www.belgiss.org.by</a> Tel: +375 17 262 14 20 email: <a href="mailto:belgiss@mail.belpak.by">belgiss@mail.belpak.by</a> Address: ul.Melezha, 3, 220113 Minsk Belarus
5	Department on Entrepreneurship Development and Support of the Ministry of Economics	Web site: <a href="http://svoedelo.by/">http://svoedelo.by/</a> Informational system for infrastructure of entrepreneurship development "Svoyo delo" (Eng. "Own business") Tel: +375 17 5081334 email: <a href="mailto:admin@svoedelo.by">admin@svoedelo.by</a> Address: Minsk rn, pos. Kolodischi, ul.Minskaya, 5, k.101, 223050 Minsk region, Republic of Belarus.,
6	Belarusian Hi-Tech Park	Web site: <a href="http://www.park.by">http://www.park.by</a> Tel: +375 17 2686911 Email: <a href="mailto:info@park.by">info@park.by</a> Address: 1, str. Kuprevich Minsk Belarus 220141
7	Information Resources for Education System Centre	Web site: <a href="http://iso.minsk.edu.by/">http://iso.minsk.edu.by/</a> Tel: +357 17 3352881 email: <a href="mailto:iso@edu.by">iso@edu.by</a> Address: per. Bronevoœe, 15a, Minsk, Belarus
8	Mogilev Technological Park	Web site: <a href="http://www.technopark.by/">http://www.technopark.by/</a> Tel: +375 222 299909, 299933 email: <a href="mailto:info@technopark.by">info@technopark.by</a> Address: 212030, Mogilev, st. Lenin, 63, Belarus
9	Annual International Exhibition "PTS - Prospective Technologies and Systems: Informatics, Telecommunications, Safety"	Web site: <a href="http://www.pts.by/">http://www.pts.by/</a> Tel: +375 017 2269129 email: <a href="mailto:expo@belexpo.by">expo@belexpo.by</a> Address: Minsk, Belarus
10	Technics and Communication, CJSC – Exhibition Company; Annual Exhibition on Telecommunication, Information and Banking Technologies "TIBO"	Web site: <a href="http://www.tc.by">http://www.tc.by</a> , <a href="http://www.tc.by/exhibitions/tibo/">http://www.tc.by/exhibitions/tibo/</a> Tel: +375 17 3060606, 203 33 91 email: <a href="mailto:info@tc.by">info@tc.by</a> Address: Minsk 220004, POB 34, Republic of Belarus
11	INFOPARK	Web site: <a href="http://www.infopark.by">www.infopark.by</a> ; <a href="http://www.infopark.org">www.infopark.org</a> Tel: +375 17 2110369 email: <a href="mailto:inbox@infopark.by">inbox@infopark.by</a> Address: ul.Komsomolskaya, 12, 220030 Minsk Belarus
12	Business Support Centre "XXI"	Web site: <a href="http://www.bc.by">http://www.bc.by</a>



	Organisation	Contact details
	Century Centre"	Tel: + 375 017 218-11-15 email: On line contact form Address: Nezavisimosti ave., Minsk,169, Republic of Belarus
13	Scientific and Technological Park "Metolit"	Web site: <a href="http://www.metolit.by">http://www.metolit.by</a> Tel: +375 17 2927678 email: <a href="mailto:alekseev@icm.by">alekseev@icm.by</a> Address: Minsk, Republic of Belarus
14	Small Entrepreneurship Incubator	Web site: <a href="http://mapzao.by/">http://mapzao.by/</a> Tel: +375 17 5081330 email: On line contact form Address: Kolodischy, Minskaya str., 5, 223051, Minsk region, Republic of Belarus,
15	Small Entrepreneurship Incubator "Beltrustinfo"	Web site: <a href="http://www.beltrustinfo.by">http://www.beltrustinfo.by</a> Tel: +357 232 711747 email: On line contact form Address: 246050, Gomel, ul. Zharkovsky, 24-A, office number 1 (5 floor), Republic of Belarus
16	Brest Business Incubator	Web site: <a href="http://www.partnerplus.by/">http://www.partnerplus.by/</a> Tel: +375 162 238213 email: On line contact form Address: ul. Fomina 17 Brest
17	"Apsel" Entrepreneurship Support Centre	Web site: <a href="http://www.ei.by/ooo-apsel">http://www.ei.by/ooo-apsel</a> Tel: +375 1561 20413 email: On line contact form Address: Grodno region, Lida, Sovetskaya St., 43, office 4, 231300, Republic of Belarus
18	Belarusian Business Portal	Web site: <a href="http://bel.biz/">http://bel.biz/</a> Tel: - email: <a href="mailto:info@bel.biz">info@bel.biz</a> Address: -
19	Electronic Business Center TUT.BY	Web site: <a href="http://www.tutby.com">http://www.tutby.com</a> <a href="http://www.tut.by">http://www.tut.by</a> Tel: + 375 017 200-41-80 email: <a href="mailto:welcome@tutby.com">welcome@tutby.com</a> Address: 220030, Minsk, Independence Avenue 11, Building 2, Suite 216, Republic of Belarus
20	Banking Technologies Centre	Web site: <a href="http://www.cbt.by">http://www.cbt.by</a> Tel: +375 17 2032916 email: <a href="mailto:cbt@cbt.by">cbt@cbt.by</a> Address: Str. Kalvariyskaya, 7, 220004, Minsk, Republic of Belarus
21	Bank Processing Centre	Web site: <a href="http://www.npc.by/">http://www.npc.by/</a> Tel: +375 17 2790000 email: <a href="mailto:info@npc.by">info@npc.by</a> Address: Minsk, Republic of Belarus
22	Bank Financial TeleNetwork	Web site: <a href="http://www.bfn.by/">http://www.bfn.by/</a> Tel: + 375 17 2048688 email: <a href="mailto:mail@bfn.by">mail@bfn.by</a> / <a href="mailto:market@bfn.by">market@bfn.by</a> Address: Str. Kalvariyskaya 1-236, 220048 Minsk Belarus