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AComIn:
Advanced Computing for Innovation

FP7 Capacity Programme
Research Potential of Convergence Regions

D5.1
Dissemination Activities in WP5 - Month 18

Prof. Gennady Agre, WP5 Leader

Prof. Galia Angelova, AComIn coordinator

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Start date of the project: 01/10/2012 **Duration: 42 months**

Version 1.0

EXECUTIVE SUMMARY

The present deliverable “Dissemination activities in WP5 - month 18” overviews all dissemination activities carried out during the first 18 months of the AComIn project. The objectives of these activities were:

- to inform regularly the EU ICT community about the AComIn results and the created new opportunities for cooperation with the IICT-BAS researchers and
- to promote the leading IICT-BAS technologies at regional and national levels.

During these activities the results, work and achievements of the incoming experienced researchers were presented. In this way the successful cooperation on European and world level as well as the opportunities for doing ICT research in Bulgaria were promoted.

All dissemination activities described in this document correspond to the AComIn “Description of Work”.

In months 1-18 AComIn disseminated the project results to a broad scientific audience within 5 scientific events. Two of them belong to world-wide renowned series of International Forums: Large Scale Scientific Computations (LSSC) and Recent Advances in Natural Language Processing (RANLP); the other 3 events are workshops oriented mainly towards Bulgarian academic and industrial communities: The Workshop “ICT for Human Health and Quality of Life” (ICT-HuHeQuL’13), The International Workshop on Autonomic Computing and Automatic Control in Computer Systems (ACACCS’13) and the Workshop “ICT for New Materials and Nano Technology” (NewNano’13).

In order to raise awareness about the novel technologies enabled by AComIn and to promote the potential of the SmartLab devices, 6 Technology Transfer Seminars were organised. The results of all these seminars can be viewed as very successful since they have allowed strengthening the existing and creating new contacts of IICT-BAS researchers with Bulgarian industrial organisations, their regional branches as well as with individual professionals from various fields. These contacts have served as a basis for initiating several pilot projects in the area of Industrial mathematics and 3D digitalisation.

Promoting AComIn to society has been achieved by organising 3 events: the first one was a non-scientific Stakeholder meeting, to which representatives of the national Government, regional authorities, Sofia municipality, the National Science Found, NGOs, industry organisation, etc. were invited. The Information Day that was organised along with the Second Steering Committee Meeting was aimed at demonstrating the project achievement and obtaining a professional evaluation of the project progress from the project partners. The Doors Open Days were organised as a wide-scale dissemination event aiming at demonstrating the potential the Smart Lab equipment and attracting young researchers from near-by countries to apply for post-docs positions in IICT-BAS. The event was preceded by a cycle of lectures given by scientists specially invited by the AComIn Executive Committee.

The project activities were also covered in 3 issues of the AComIn (e-)Newsletter published in English and Bulgarian.

Three TV emissions presented AComIn as well as one newspaper article in АЗБУКИ (*Alphabet*), published by the Ministry of Science and Education.

Document Information

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Summary	The present deliverable “Dissemination activities m. 18” contains the description of all dissemination activities accomplished within WP5 during the first 18 months of the AComIn project. The objectives of such activities were twofold: *(i)* to inform regularly EU ICT community about the AComIn results and the created new opportunities for cooperation with the IICT-BAS researchers and *(ii)* to promote the leading IICT-BAS technologies at regional and national levels. These activities presented the results, work and achievements of the incoming experienced researchers and IICT scientists. In such a way the successful cooperation on European and world level as well as the opportunities of doing ICT research in Bulgaria were promoted. All dissemination activities described in this document are aligned to the AComIn “Description of Work”.
Keywords	Dissemination activities, Scientific conferences, Information days, Technology Transfer Seminars, User Communities, Doors Open Days

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Table of Contents

1. SUPPORT OF PROJECT WEB-SITE

The web-site of the project (http://www.iict.bas.bg/acomin/index.html) contains complete and actual information about the project, which is updated on a regular basis. The site consists of two areas – the Public Area containing sections such as *Project Objectives*, *Topics in ICT*, *Progress beyond the state of art*, *Work Packages*, *Employed incoming post-docs*, *SmartLab Equipment*, *Deliverables* and *User Communities*, *Publications and Talks*, and *Open Positions* (Fig. 1).

The *News*-menu in the Public Area contains up-to-date information about events that happen in the project as well as media reactions. The Newsletters, published in English and Bulgarian, are uploaded in the Public Area as well.

Figure 1. The Public Area of AComIn site

Figure 2. The Team Area of AComIn site

The Team Area (Figure 2) contains information intended for internal use and consists of sections such as *Deliverables with restricted dissemination*, *Internal AComIn documents and templates*, *Internal reports on activities done*, and *Milestones and Deliverables*.

The activities in *Internal Reports* are structured according to the related Work Packages. It is now an established practice to collect there reports about all employments and mobilities. In this way all members of the AComIn team can follow the project progress.

2. FIRST STAKEHOLDERS MEETING

The first Stakeholders Meeting was organised in IICT-BAS on January 2013. Representatives of the following organisations were invited:

- Bulgarian Association of Software Companies (BASSCOM)
- Bulgarian Association of Information Technologies
- Bulgarian Information and Communications Technology Council
- Science Department of the Bulgarian Ministry of Education and Science
- Sofia Municipality
- National Science Foundation
- The Bulgarian Branch Chamber - Machine Building
- Sofia Technopark
- Administration of the Bulgarian Presidency
- Sofia University
- Technical University of Sofia
- Medical University of Sofia
- Joint Innovation Centre of the Bulgarian Academy of Sciences
- Bulgarian Cluster of Mechatronics
- Office for Technology Transfer, Sofia

The AComIn coordinator – Prof. Galia Angelova made a presentation entitled "AcomIn: What can we propose for scientific community, business and society" (http://www.iict.bas.bg/acomin/Stakeholders-Committee-meeting/1st-meeting-31Jan2013-StakeholderCommittee.pdf), in which she briefly presented the project and described opportunities for mutual cooperation of IICT-BAS and other scientific, business and public organisation in the frame of AcomIn project. The talk was followed by a fruitful discussion between the invited participants and members of AcomIn's Management Board. The next meeting of Stakeholders will be organised in July 2014.

The Photo report on this event can be found in http://www.iict.bas.bg/acomin/Stakeholders-Committee-meeting/index.html. The list of the Stakeholders Meeting Participants is given in Appendix A.

Figure 3. Discussions at the Stakeholders Meeting

3. User Community Seminars Months 1-18 (Programme and Lists of Participants)

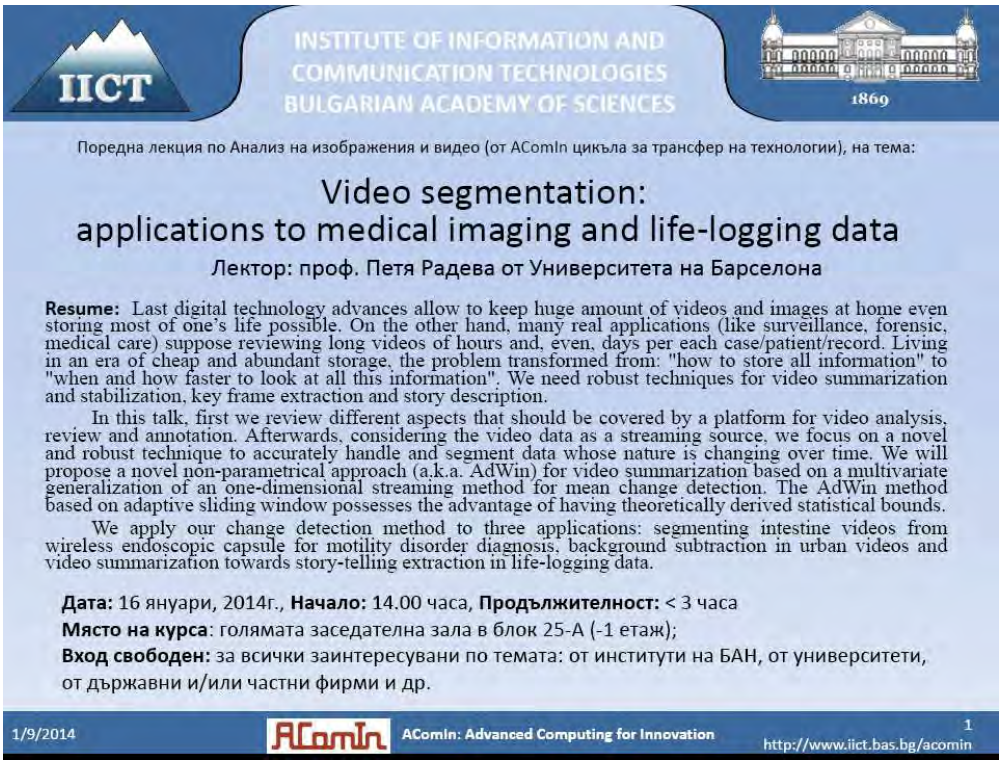
3.1. Technology Transfer Workshops "Advances in Image and Video Analysis"

During the reporting period two Technology Transfer seminars on *Advances in Image and Video Analysis* were organised. The first seminar was held on July 24-26, 2013 in IICT-BAS. The theme of the seminar was ***"Computational Vision and its Application to Medical Diagnosis"*** and the lecturer was Prof. Petia Radeva from the University of Barcelona, Spain. The seminar was organised as a 14 hours course (see the Announcement below).

The seminar was open to all interested experts: from public and/or private companies, researchers from the institutes of the Bulgarian Academy of Sciences, young researchers from various universities, and others. The workshop brought together 33 participants from: 4 private companies (MMSolutions AD, 3PS-SIMULIA, AVIQ Bulgaria Ltd., and Vitronic GmbH), 2 universities (Technical University of Sofia and Technical University of Veliko Tarnovo), 17 participants from IICT, as well as representatives of 6 other Institutes of the Bulgarian Academy of Sciences. The presentation slides are available in the Team Area of the AComIn site, menu "*Reports*", *WP3 Incoming short visits*: (http://iict.bas.bg/acomin/team_area_reports_wp3-incomming-short-visists.html). The list of participants (in Bulgarian) can be found in the Team Area, menu "*Reports*", WP2 at URL http://iict.bas.bg/acomin/docs/wp2/16-Jan-2014.pdf.

On January 16, 2014 Prof. Petia Radeva was the lecturer of the second technology transfer seminar. The theme was ***"Video segmentation: applications to medical imaging and life-logging data"*** (see the Announcement below). The seminar gathered 13 researchers from the Technical University of Sofia, the University of Library Studies and Information Technologies and several research institutes from the Bulgarian Academy of Sciences.

The presentation slides and the Lists of Participants are available in the Team Area, at the URLs for WP3 and WP2 shown above.



3.2. TECHNOLOGY TRANSFER WORKSHOP "3D TECHNOLOGIES IN THE TEXTILE INDUSTRY AND FASHION"

The first seminar of the "3D Technologies in the Textile Industry and Fashion" user community took place in IICT in the period September 2 – 5, 2013 (see the Announcement below). The seminar was organised for the Bulgarian textile and fashion specialists with the aim to increase the competitiveness of the Bulgarian industry. The lecturer was Dr. Goulev from the London School of Fashion, The University of the Arts. Dr. Petar Goulev made the participants familiar with the current scientific and technological advancements in the field. The lectures covered topics related to user opinion studies, scanning and creating 3D models of the human body, 3D design of cloths and accessories, as well as using 3D models in electronic trade in the fashion industry. Dr. Goulev also presented the innovative concept of emotional fashion, developed together with Lisa Stead: clothes that change their appearance according to the mood and feelings of the wearer, e.g. clothes with varying colours. The list of participants included company owners and managers from the textile industry, fashion designers, university professors and teachers from specialised secondary schools.

Leading Bulgarian companies in the field of 3D technologies were invited in the seminar upon the speaker's invitation: 3D Print Bulgaria (www.3dpring-bg.com), demonstrated the creation of 3D objects in real time using MakerBotReplicator2 and environmentally clean corn pre-products, and Team Ltd. (www.team.bg) provided software for a manual 3D scanner ZScanner 800, for scanning textile objects and human shapes in real time. The seminar gathered 26 attendees. The list of participants is stored in the Team Area, menu "Reports", WP2 at URL http://iict.bas.bg/acomin/docs/wp2/2-5-Sept-2013.pdf.

The event was organised with the help and support of The British Council, whose policy includes continuous wide-ranging support for carrying out lectures in Bulgaria by specialists, who have obtained scientific degrees in Great Britain, and The Ministry of Education and Science of the Republic of Bulgaria, which provides facilities and competent technical support for conducting cutting edge technology trainings in Bulgaria.

The second seminar of this community was held in IICT on March 17, 2014. The theme was ***"3D scanning and digitalisation"*** (see the Announcement below).

The seminar was organised by IICT-BAS and two Bulgarian companies – ADA 3D (http://www.ada3d.com) and GeoCAD-93 (www.geocad93.com). Prof. Galia Angelova, the Coordinator of AComIn, briefly presented the project objectives and described the 3D equipment bought in the frame of AComIn. Mr. Jury Radkov, the Manager of ADA 3D, delivered a presentation *"3D scanning – general review of the technology of 3D scanning and types of 3D scanners; main application areas and example of best practices"*. The presentation of Mr. Milush Blagoev from GeoCAD-93 was on *3D laser scanning, digitalisation and preservation of immovable objects of cultural heritage*.

The presentations can be found in the Public Area of AComIn site, menu "User Communities" at URL http://iict.bas.bg/acomin/docs/user-communities/17-March-2014-3D-scannning.pdf. The seminar was attended by 36 listeners from 16 organisations. The list of participants (in Bulgarian) is available in the Team Area, menu "Reports", WP2 at URL http://iict.bas.bg/acomin/docs/wp2/17-March-2014.pdf.

3.3. TECHNOLOGY TRANSFER WORKSHOP "INDUSTRIAL MATHEMATICS"

The first seminar on ***Industrial Mathematics*** was held on December 19, 2013 in IICT-BAS (see the Announcement below).

AComIn

Seminar on Industrial Mathematics

Sofia, December 19, 2013

Organized by Institute of Information and Communication Technologies
Bulgarian Academy of Sciences

IICT–BAS, Acad. G. Bonchev Str. Block 2

10:30 - 12:30 Dimitar Karastoyanov, IICT, BAS
AComIn SmarthLab equipment presentation
12:30 - 14:00 Lunch break

IICT–BAS, Acad. G. Bonchev Str. Block 25A

14:00 - 15:00 Oleg Iliev, Fraunhofer ITWM, Kaiserslautern
Mathematics as technology: good practices in various industrial applications
15:00 - 15:10 Nikola Kosturski, IICT, BAS
Computer simulation of radio frequency ablation
15:10 - 15:20 Yavor Vutov, IICT, BAS
Supercomputer simulation of the cooling process in a porous inert media gas burner
15:20 - 15:30 Ivan Georgiev, IICT, BAS
Computer simulation of wood polymer composite matherials
15:30 - 16:30 Panel discussion

Organizer: Prof. Svetozar Margenov
Contact person: Dr. Ivan Georgiev, e-mail: ivan.georgiev@parallel.bas.bg

The event was organised in collaboration with Fraunhofer ITWM, Kaiserslautern, Germany (partner in the AComIn project). The cooperation with the Bulgarian Branch Chamber of Machine Building (www.castingarea.com/societies/bbcmb.htm) and the Cluster of Mechatronics and Automation (http://www.cluster-mechatronics.eu/) was highly appreciated. The aim of the event was to demonstrate the potential of the available SmartLab equipment and to confirm the IICT intention for cooperation and know-how transfer with industrial partners. The first part of the seminar was devoted to a presentation of the SmartLab equipment recently purchased in the framework of the AComIn project. The program continued with a plenary lecture titled *"Mathematics as technology: good practices in various industrial applications*" given by Prof. Oleg Iliev from Fraunhofer ITWM, followed by presentations of particular industrial applications developed in IICT. The seminar was closed with a panel discussion about problems and perspectives in industrial mathematics. A key topic was related to practical questions/experience concerning real life collaboration between academic researchers and industrial companies. The seminar gathered 6 researchers from IICT-BAS and 26 participants outside IICT: 18 of them from industrial entities (mostly representing SMEs), 7 - from universities and academic institutes from Bulgaria and 1 – from Germany. The list of industrial participants is available in the Team Area, menu "Reports", WP2 at URL http://iict.bas.bg/acomin/docs/wp2/19-Dec-2013.pdf (in Bulgarian).

3.4. TECHNOLOGY TRANSFER WORKSHOP "ADVANCES IN TERMOGRAPHY"

The first technology transfer seminar on thermography was held on February 11-13, 2014 in IICT. It was organised as a three day training course titled ***"Thermography – making and analysing thermograms made by FLIR P640 Thermo camera"*** (see the Announcement bellow).

The lecturer was Dr. Todor Bagarov from STEDOR Ltd., representative of FLIR Systems in Bulgaria. The course aimed at familiarizing listeners with basic knowledge of Infrared Thermography; how to operate the camera under different conditions and for various purposes; to teach them how to do an appropriate treatment of the measurement situation in the field or laboratory conditions; how to identify and correct potential error sources / issues; how to be able to do IR inspections following written guidelines and to create database from the result of inspection and how to create final report using FLIR Reporter Pro software. The course included the following topics:

- Infrared thermography applications overview;
- Basic camera setup and operation in different conditions;
- Theories behind infrared thermography and heat transfer;
- Discuss the effects of emission, reflection, and transmission on IR camera measurements;
- Learn how to correct measurements when imaging through IR windows or unknown emissivity of material;
- Thermal and infrared science fundamentals;
- Heat transfer;
- Thermal measurement;
- Electrical, mechanical and building applications;
- Thermography safety.

The course was attended by 18 specialists from IICT and 1 specialist from VIDAKO Ltd. Company. The list of participants can be found in the Team Area, menu "*Reports*", *WP2* at URL http://iict.bas.bg/acomin/docs/wp2/11-13-Feb-2014.pdf

СПЕЦИАЛИЗИРАН КУРС ЗА РАБОТА С ТЕРМОКАМЕРА FLIR P 640

11-13 февруари 2014 г., ИИКТ-БАН, Блок 25А, зала 2 (приземен етаж)

Лектор: ***инж. Тодор Багаров*** от фирма STEDOR
(лицензиран представител на FLIR за България)

Първи ден – 11.2.2014 г. 10.00-13.00, 14.00-17.00 ч.

Термокамера FLIR P640 – общо запознаване:

- устройство и функции,
- принцип на измерване,
- настройки на параметрите,
- работа с термограми.

Втори ден – 12.2.2014 г. 10.00-13.00, 14.00-17.00 ч.

Специализиран софтуер – основни модули:

- изграждане на термограми,
- обработка на изображенията,
- средства за високотемпературни измервания,
- средства за измервания с висока точност.

Трети ден – 13.2.2014 г. 10.00-13.00, 14.00-17.00 ч.

Техника на измерването – специфични приложения:

- Заваръчни шевове
- Термоизолации
- Механични елементи
- Ел. инсталации
- Автомобилни приложения
- Температурна картина при триене
- Термограми при опън и натиск

Курсът е безплатен. Поканват се заинтересовани специалисти

4. THE FIRST INFORMATION DAY

The first Information Day took place on October 24, 2013 in Starosel, Bulgaria and was devoted to discussing the project achievements in year 1. The second meeting of AComIn's Steering Committee took place within the same time frame. The Information Day contained 13 presentations about various AComIn activities (see Program below). Three presentations summarised the results of the incoming post-docs, recruited in the project in year 1 (Dr Jean Michel Sellier, Dr Stanislav Stoykov and Dr Irina Temnikova). The Progress report for year 1 was presented too, including a discussion of the project progress towards the objectives, explanation of deviations and the related contingency plan, as well as a financial analysis.

After the Information Day presentations, the Steering Committee members met at a special session to discuss findings, make suggestions and plan further tasks in year 2. They concluded that IICT had succeeded in attracting several excellent post-docs who had the potential to become future team leaders. The young people get the feeling that they are part of the team. In that sense the partners considered the first year an excellent start for the project. The Steering Committee members also noted that AComIn was a catalyst of a very important process for Bulgaria – Technology Transfer to industry. The project forces the institute to adopt good practices in innovation and to develop related normative documents. This is an extremely positive project effect and this is the right type of project for Bulgaria as it builds upon the existing good background in the Institute, strengthens it and prompts IICT to develop Innovation Policies.

A more detailed report on the Steering Committee decisions can be found in the Team Area, Deliverable D7.3 Steering Committee Conclusions regarding AComIn Performance Year 1. The Photo report about the meeting and the Information day can be seen in http://iict.bas.bg/acomin/events/24-October-2013/gallery/index.html.

Information Day and 2nd Steering Committee Meeting Starosel, Bulgaria, 24 October 2013

PROGRAM

Chair: Svetozar Margenov
8:45-9:00 Opening
9:00-9:30 Galia Angelova, Introduction and overview of AComIn Progress in year 1
9:30-9:45 Todor Stoilov, Appointments in WP1 "Strengthening the IICT Human Potential"
9:45-10:00 Ivan Dimov, Progress in WP2 "Purchase of modern equipment for setting up a Smart Periphery Lab" and presentation of D2.1 (Smart Lab tender and delivery of devices, month 12)
10:00-10:15 Krassimir Georgiev, Summary of networking activities in WP3 (Conferences, Secondments, Short visits - incoming, Short visits - outgoing)
10:15-10:35 Coffee break and questions on reported activities in WP1 and WP2

Chair: Galia Angelova
10:35-10:50 Kostadin Kostadinov, IICT Innovation Strategy in WP4 and presentation of D4.1 (Suggestions for tuning the IICT Innovation Strategy and IP Policy to the best EU practices,month 12)
10:50-11:05 Dimitar Karastoyanov, IPR Protection in WP4: current results and plans for years 2-3, based on the Smart Lab equipment
11:05-11:20 Gennady Agre, Dissemination activities in WP5 and emerging User Community in "Management of Digital Content"
11:20-11:35 Dimo Dimov, Research results and User Communities in "Image Processing" and "3D Technologies"

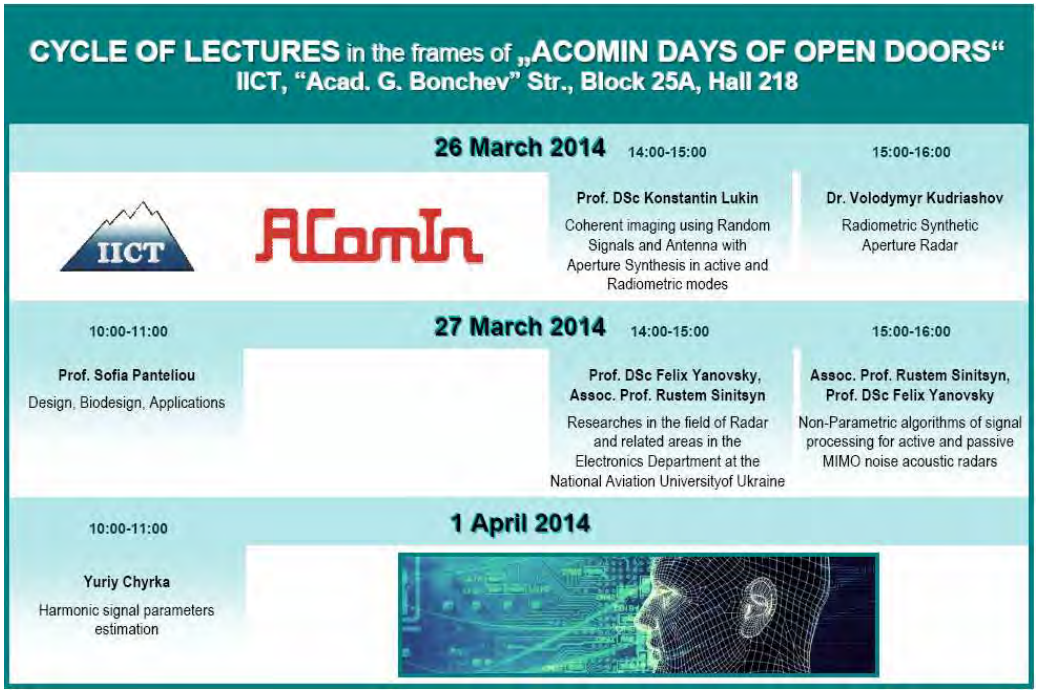
11:35-11:45 Svetozar Margenov, Presentation of the emerging User Community in "Industrial Mathematics"
11:45-12;00 Questions on reported activities in WP3, WP4 and WP5
12:00-14:00 Lunch Break

Chair: Ivan Dimov
14:00-14:10 Vladimir Monov, Experience with new partners: development of joint work with the University of Örebro
14:10-14:20 Lyubka Doukovska, Towards building a User Community in "ICT for Energy Efficiency"
14:20–14:30 Kiril Alexiev, Acquaintance and plans for using the Acoustic Holography system (arrived on 8/10/2013)
14:30–14:40 Rumen Andreev, Supporting the development of Innovation capacity in IICT by a Technology Transfer Office
14:40-14:55 Galia Angelova, Progress Management Report for year 1
14:55-15:15 Increasing the IICT Human Potential: assessing research achievements of the employed incoming post-docs (J.M. Sellier, S. Stoykov, I. Temnikova)
15:15-16:30 Coffee break and informal discussions

16:30-17:30 Meeting of the Steering Committee members
17:30 Feedback from the International Partners and suggestions for year 2
18:00 Closing
The list of the Information Day participants is shown in Appendix A.

5. DOORS OPEN DAYS

The Doors Open Days were organised in IICT-BAS on March 28-29, 2014. The aim of this event was to demonstrate the Smart Lab equipment and its applications. The event was preceded by a cycle of lectures (see program below) delivered by scientists especially invited by the Executive Committee.



Some of the speakers were potential candidates for post-doc positions in AComIn (and their talks were a kind of job interviews). All invited lecturers work in topics related to the Smart Lab equipment.

The program of the Doors Open Days is shown below.

Doors Open Days in IICT - BAS, Sofia 1113, Acad. G. Bonchev Str. Block 25A and Block 2

Demonstrations of equipment and applications (*Smart Lab*, see http://www.iict.bas.bg/acomin/smartLab.html)

	Friday 28 March 2014				Saturday 29 March 2014			
10:00					OPENING Hall 2, Block 25A			
10:30	OPENING Hall 2, Block 25A				3D Visual wall, Hall 2 Block 25A			
11	Acoustic holography, Hall 2, Bl. 25A	Thermo- & high speed cameras, Hall 218 Bl. 25A	Laser Particle sizer, 3D scanner, DEM Hall 110 Block 2	Tomography, Hall 010 Bl. 2				
12	Acoustic holography, Hall 2, Bl. 25A	Thermo- & high speed cameras, Hall 218 Bl. 25A	Laser Particle sizer, 3D scanner, DEM Hall 110 Block 2	Tomography, Hall 010 Bl. 2	Acoustic holography, Hall 2, Bl. 25A	Thermo- & high speed cameras, Hall 218 Bl. 25A	Laser Particle sizer, 3D scanner, DEM Hall 110 Block 2	Tomography, Hall 010 Bl. 2
13	Lunch, discussions				Acoustic holography, Hall 2, Bl. 25A	Thermo- & high speed cameras, Hall 218 Bl. 25A	Laser Particle sizer, 3D scanner, DEM Hall 110 Block 2	Tomography, Hall 010 Bl. 2
14:30	3D Visual wall, Hall 2 Block 25A				Discussions			
16:00	Acoustic holography, Hall 2, Bl. 25A	Thermo- & high speed cameras, Hall 218 Bl. 25A	Laser Particle sizer, 3D scanner, DEM Hall 110 Block 2	Tomography, Hall 010 Bl. 2	Closing			
17:00	Discussions							
17:30	Closing							

Capacity of rooms:
Hall 2 basement, Block 25A – 70 seats (for opening, demos of the Visual wall);
20 people (for demos of the acoustic holography)
Hall 218, Block 25A – 25 people
Hall 110, Block 2 – 15 people
Hall 010, Block 2 – 20 people

Recommended registration:
Silvia Teodosieva <silvits@abv.bg>

At the Opening ceremony Prof. Galia Angelova, the Coordinator of AComIn project, explained the main objectives of the project and briefly introduced the project tasks as well as the results already achieved. Then the visitors were given the opportunity to see the Smart Lab equipment in action and to discuss with AComIn members possible applications of such equipment. The Acoustic Holography equipment was demonstrated in Hall 2 of block 25a. The application of beam-forming techniques for noise source identification was shown. Thermo- and high speed cameras were demonstrated in Hall 218 of Block 25a. The demonstrations of the Laser Particle sizer, Hand-held colour 3D laser scanner and the DEM software were organised in Hall 110 of Block 2. Experiments with the Computer Tomograph XTH 225 C were demonstrated in Hall 010 of Block 2. The potential of the 3D Visual Wall was demonstrated in Hall 2 of Block 25A. The Doors Open Days were attended by more than 120 visitors from 30 organisations.

The event was reflected by the National Bulgarian TV Channel 1 (see http://bnt.bg/predavanyia/po-sveta-i-u-nas/po-sveta-i-u-nas-emisiya-12-00-29-mart-2014 after 9th minute).

The lists of visitors to the Doors Open Days (in Bulgarian) can be found in the Team Area, menu "*Reports*", *WP5* at URL http://iict.bas.bg/acomin/team_area_reports_wp5-dissemination.html.

6. ACOMIN-SUPPORTED SCIENTIFIC EVENTS

6.1 THE WORKSHOP "INFORMATION AND COMMUNICATION TECHNOLOGIES FOR HUMAN HEALTH AND QUALITY OF LIFE (ICT-HUHEQUL'13)

The Workshop "Information and Communication Technologies for Human Health and Quality of Life (ICT – HuHeQuL'13) was held on May 15-16 in Stara Zagora Mineral Baths, Bulgaria. The discussed topics ranged from theoretical considerations of modelling and simulation approaches to demonstration of application prototypes that can be used in healthcare decision making, ambient assisted living, orthopaedic surgery, quality preservation of foods etc.

The event was attended by 38 participants (15 from IICT-BAS, 3 invited lecturers, 5 participants from companies, 8 from various academic organisations, and 7 local experts leading or working in regional institutions). 22 talks were given in the following topics: ICT for Human Health – 6 presentations, ICT for Quality of Life – 6 presentations, ICT in Medical Robotics – 5 presentations and ICT for Healthy Food – 5 presentations. The Workshop Program can be found at http://iict.bas.bg/acomin/15-17-May-2013/Workshop-ICT-HuHeQuL.pdf

The extended versions of 6 talks presented at the Workshop have been selected for publishing in two referenced Bulgarian scientific journals: 4 papers – in *"Bulgarian Journal of Agricultural Science" (IF = 0.17)* and 2 papers - in *"Cybernetics and Information Technology"* (SCOPUS SJR = 0.101).

The support provided by AComIn to ICT-HuHeQuL'13 enabled to cover the travel expenses and accommodation of the keynote speakers who presented innovative aspects of ICT in Human Health and Quality of Life. All participants were informed about AComIn, its objectives and results, and the possibility to apply for postdoctoral positions in the project. This improves the image of IICT-BAS as a regional Centre of Excellence in Human Health and Quality of Life.

The list of the workshop participants is shown in Appendix A.

List of AComIn-related published papers by IICT-BAS scientists

1. S. Fidanova. Application of HPD Model for Predicting Protein Mutations. *Cybernetics and Information Technologies* Vol. 13 №.4, 2013, Bulgarian Academy of Sciences, 95-103, Print ISSN: 1311-9702; Online ISSN: 1314-4081, DOI: 10.2478/cait-2013-0056.
2. M. Doneva, I. Nacheva, P. Metodieva, Y. Todorov, D. Miteva, L. Georgieva and Tsv. Tsvetkov. Application of Cryobiotechnologies for Development of Lyophilized Polyenzyme Complexes. *Bulgarian Journal of Agricultural Science, Vol. 20, 2014, Bulgarian Agricultural Academy,* ISSN 1310-0351 (in print).
3. I. Nacheva, M. Doneva, Y. Todorov, P. Metodieva, D. Miteva, K. Dimov and Tsv. Tsvetkov. Innovative Technologies for Creation of Probiotic Foods. *Bulgarian Journal of Agricultural Science, Vol. 20, 2014, Bulgarian Agricultural Academy,* ISSN 1310-0351 (in print).
4. D. Miteva, K. Dimov, I. Nacheva, Y. Todorov, M. Doneva, P. Metodieva, and Tsv. Tsvetkov. Prolongation of the Storage and Quality Preservation of Potato Semi-finished Foods by Specific Technological Treatment. *Bulgarian Journal of Agricultural Science, Vol. 20, 2014, Bulgarian Agricultural Academy,* ISSN 1310-0351 (in print).
5. D. Miteva, K. Dimov, I. Nacheva, Y. Todorov, M. Doneva, P. Metodieva, and Tsv. Tsvetkov. Modern Technological Approaches for Ensuring of Harmless and Quality Fruits. *Bulgarian Journal of Agricultural Science, Vol. 20, 2014, Bulgarian Agricultural Academy,* ISSN 1310-0351 (in print).

6.2 THE INTERNATIONAL WORKSHOP "AUTONOMIC COMPUTING AND AUTOMATIC CONTROL IN COMPUTER SYSTEMS" 2013

The International Workshop "Autonomic Computing and Automatic Control in Computer Systems" (ACACCS) was organised as a co-event of the International Conference "Automatics and Informatics" 2013. The Workshop was held on October 3-4 2013 in Sofia. It was devoted to presentations of the research results achieved by the scientific effort connected with the AComIn project and gathered scientists from the Bulgarian Academy of Sciences, Technical University, Sofia, the University of Artois, France, Scientific Institute of Transport Technologies, Paris, France, University of Technologies, Belfort, France, who participated actively in the research and development of modern transportation systems. Most of the particular topics considered in the workshop, concerned modelling, control and optimisation of the transportation systems.

The Workshop was attended by 26 participants (14 – from IICT-BAS, 9 – from Bulgarian institutions and 3 – from abroad). The SCIENTIFIC PROGRAM contained 3 invited talks and 16 oral presentations. After the workshop six papers were selected and published in Volume 13, No 4, 2013 of "Cybernetics and Information Technologies" journal (SJR = 0.101). Some photos of the workshop can be found in http://iict.bas.bg/acomin/events/3-4-October-2013/snimki/index.html.

The Invited lecturers (supported by AComIn) gave the following talks:

- H. Abouaïssa (Université Lille Nord France): *"State Estimation for Traffic Flow Cell Transmission Model"*
- H. Haj Salem, N. Farhi, J. P Lebacque (Institut Français des sciences et Technologies des Transport de l'aménagement et des réseaux (IFSTTAR) COSYS/GRETTIA): *"Risk Index Model Bulding for Real Time Crash Prediction on Urban Motorway Traffic"*.
- Chariete, M. Bakhouya, J. Gaber, M. Wack (Universite de Technologie de Belfort Montbéliard) *"Towards a Design Space Exploration Methodology for System On-chip"*.

The support provided by AComIn to ACACCS'13 enabled the organizers to cover the travel expenses and accommodation of the three renowned keynote speakers (all of them were grateful of the support of ACOMIN) who presented innovative aspects of the autonomic properties in Computer and Transportation Systems. The participation of the above-mentioned three keynote speakers at the workshop was very important for the IICT seniors because it thus became possible for them to listen to state-of-the-art presentations, to discuss some aspects of their work and to establish contacts for future collaborations. Several ideas for future common work were discussed. All ACACCS'13 participants were informed about AComIn, its objectives and results, and the possibility to apply for postdoctoral positions in the project. This improves the image of IICT as a regional Centre of Excellence in Autonomic Computing and Automatic Control in Computer Systems.
The list of the ACACCS'13 participants is shown in Appendix A.

List of AComIn-related published papers of IICT-BAS scientists

1. Stoilova, K., T. Stoilov, K. Nikolov. Autonomic Properties in Traffic Control. *Cybernetics and Information Technologies* Vol. 13 №.4, 2013, Bulgarian Academy of Sciences, 18-32, Print ISSN: 1311-9702; Online ISSN: 1314-4081, DOI: 10.2478/cait-2013-0050.
2. E. Trichkova, K. Stoilova. An Approach for Quality Assessment and Efficiency of a Web-Based System for Distance Learning. *Cybernetics and Information Technologies* Vol. 13 №.4, 2013, Bulgarian Academy of Sciences, 63-73, Print ISSN: 1311-9702; Online ISSN: 1314-4081, DOI: 10.2478/cait-2013-0054.

6.3. THE WORKSHOP "ICT FOR NEW MATERIALS AND NANOTECHNOLOGY" 2013

The Workshop "ICT for New Materials and Nanotechnologies" (NewNano'13) was organised as an accompanying event of the International Conference "Robotics, Automation and Mechatronics`2013" (RAM 2013 - http://www.iict.bas.bg/acomin/events-8-1-Oct-2013.html). The Workshop was held on October 8-9 in Bankya, Bulgaria. It covered major research topics related to the AComIn project such as mobile systems, micro and nano robotics, robot mechanisms and design, robot perception and control, application of robotics and mechatronics, new materials, nano technologies etc. The Workshop was attended by 30 participants (23 – from IICT-BAS, 7 – from Bulgarian institutions and companies). The Workshop scientific program included 3 invited talks, 11 talks of Bulgarian partners of IICT-BAS and 21 oral presentations of researches from IICT-BAS. The Workshop Proceedings was published as a special volume of Bulgarian Robotic Society series (ISSN 1314-4634).
The invited lecturers, supported by AComIn, gave the following presentations:

- Prof. Dr. Sc. Ivan Yatchev (Dean of Electro Faculty, TU-Sofia): *Braille screen for blind peoples for better quality of life*.
- Prof. Dr. Todor Neshkov (IEEE, R&A Chapter, TU-Sofia): *Mechatronics in the education: the experience of the Technical University of Sofia*.
- Prof. Dr. Kostadin Kostadinov (GIS Transfer Centre, Inst. of Mechanics – BAS): *Microrobotics applications in micro-and nanotechnology*

The support, provided by AComIn to NewNano and RAM 2013, made it possible to cover the costs for accommodation of the keynote speakers who presented innovative aspects of New Materials and Nanotechnologies, as well as Robotics, Automation and Mechatronics. All participants were informed about AComIn, its objectives and results, and the possibility to apply for postdoctoral positions in the project. This improves the image of IICT as a regional Center of Excellence in New Materials and Nanotechnologies, as well as Robotics, Automation and Mechatronics.

The list of the NewNano 2013 workshop participants is shown in Appendix A.

List of AComIn-related published papers of IICT-BAS scientists

1. M. Kandeva, B. Sokolov, B. Ivanova, V. Pojidaeva, S. Stoenchev, C. Agalarev, Influence of Nano-Diamond Particles on the Tribological Characteristics of Nickel Chemical Coatings. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 5-11, ISSN 1314-4634.
2. M. Kandeva, D. Karastoyanov, B. Sokolov, A. Dimitrova, S. Stoenchev, N. Nikolov, C. Agalarev, M. Mihov, Friction and Wear of Ni Coatings with Nanosize Particles of SiC. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 12-15, ISSN 1314-4634.
3. M. Kandeva, S. Stoenchev, V. Pozhidaeva, D. Karastoyanov, J. Javorova, M. Mihov, G. Isaev, Composite Coatings to Improve Durability of the Working Body of the Drill. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 16-19, ISSN 1314-4634.
4. T. Atanasova, Integration of Heterogeneous Data and Processes in Digital Home. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 20-24, ISSN 1314-4634.

5. T. Tashev, A. Bakanov, R.Tasheva, Determination of the value of convergence parameter in a procedure of calculating the upper boundary of throughput for packet switch. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 34-37, ISSN 1314-4634.
6. S. Fidanova, P. Matinov, Number of ant versus number for iterations ant colony optimization algorithm for wireless sensor layout. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 90-93, ISSN 1314-4634.
7. N. Stoymenov, S. Gyoshev, Thermography with infrared camera. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 116-117, ISSN 1314-4634 (in Bulgarian).
8. M. Mihov, Goran Isaev, Management of stand to examine the effect combined impact. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 127-132, ISSN 1314-4634 (in Bulgarian).
9. K. Kolchakov, V. Monov, An approach for hardware solution of the conflicts problem in switching nodes. In: *Proceedings of Workshop "ICT for New Materials and Nanotechnologies" NewNano 2013, October 8-10213, Bankya, Bulgaria, Bulgarian Robotic Society Series*, Prof. Marin Drinov Academic Publishing House, 2013, 138-141, ISSN 1314-4634 (in Bulgarian).

6.4. THE 9TH INTERNATIONAL CONFERENCE "LARGE-SCALE SCIENTIFIC COMPUTATIONS" (LSSC'13)

The 9th International Conference "Large-Scale Scientific Computations" (LSSC'13) was held on June 3-7, 2013 in Sozopol, Bulgaria. The conference is a biannual event organised in Bulgaria since 1995 (http://parallel.bas.bg/Conferences/SciCom13/) and this issue was accompanied by the Symposium on "Numerical Solution of Partial Differential Equations"NSPDE'13). The Programme Committee of the conference consisted of 27 members representing leading universities and research institutes from Austria, Bulgaria, Denmark, Germany, Italy, Poland, Sweden and USA. A wide range of recent achievements in the field of scalable numerical methods, algorithms and their applications was addressed during the conference. The meeting has provided a forum for exchange of ideas between scientists, who develop and study numerical methods and algorithms, and researchers, who apply them for solving real life problems. The following major scientific topics, all related to the AComIn project activities, were included: Hierarchical, adaptive, domain decomposition and local refinement methods; Robust preconditioning algorithms; Monte Carlo methods and algorithms; Numerical linear algebra; Control systems; Large-scale computations of environmental biomedical and engineering problems; High-performance algorithms for engineering problems; Parallel algorithms and performance analysis.

The Scientific Programme of the conference included 5 Plenary Invited talks, 11 Special Sessions and Sessions of Contributed Talks. Six of the Special Sessions were directly related to the AComIn project activities.

The Plenary Invited lecturers gave the following talks:

- Joseph Pasciak: *Variational Formulations of Problems Involving Fractional Order Differential Operators*
- Gundolf Haase: *Multiple-GPU AMG Solver Environment for Biomedical Applications*

The conference was attended by 163 participants (25 - from IICT-BAS, 19 - Bulgarian participants outside IICT-BAS, 110 - foreign participants including 5 Plenary Invited Speakers and 9 - invited participants - 2 of them supported by AComIn).

The conference proceedings will be published in a special volume 8353 of Springer Lecture Notes in Computer Science (LNCS) in 2014.

The support, provided by AComIn to LSSC'13, enabled:

- To cover the local expenses of several worldwide known scientists giving top level plenary and key note invited talks.
- To support a part (10 from 25) of the participants from IICT.

The conference materials included the AComIn flyer informed the participants about the objectives and specific activities of the project. The AComIn support was acknowledged in the LSSC'13 Book of Abstracts as well as at the conference website.

List of AComIn-related published papers of IICT-BAS scientists

1. P. Schwaha, M. Nedjalkov, S. Selberherr, J.M. Sellier, I. Dimov, R. Georgieva, Stochastic Formulation of Newton's Acceleration. In: *Proceedings of LSSC'13 – LNCS 8353*, Springer, 2014 (in print).
2. J. M. Sellier, M. Nedjalkov, I. Dimov, S. Selberherr, The Role of Annihilation in a Wigner Monte Carlo approach. In: *Proceedings of LSSC'13 – LNCS 8353*, Springer, 2014 (in print).
3. P. Koprinkova-Hristova, Adaptive Critic Design and Heuristic Search for Optimization. In: *Proceedings of LSSC'13 – LNCS 8353*, Springer, 2014 (in print).
4. S. Margenov, S. Stoykov, Y. Vutov, Numerical Homogenization of Heterogeneous Anisotropic Linear Elastic Materials. In: *Proceedings of LSSC'13 – LNCS 8353*, Springer, 2014 (in print).
5. S. Stoykov, S. Margenov, Nonlinear Forced Vibration Analysis of Elastic Structures by Using Parallel Solvers for Large-Scale Systems. In: *Proceedings of LSSC'13 – LNCS 8353*, Springer, 2014 (in print).
6. E. Atanassov, D. Georgiev, T. Gurov, A. Karaivanova, and Y. Nikolova, Distributed system for query processing with Grid authentication. In: *Proceedings of LSSC'13 – LNCS 8353*, Springer, 2014 (in print).
7. T. Tashev, V. Monov, Large-Scale Simulation of Non-Uniform Load Traffic in Studying the Throughput of a Crossbar Packed Switch. In: *Proceedings of LSSC'13 – LNCS 8353*, Springer, 2014 (in print).

6.5. THE 9TH INTERNATIONAL CONFERENCE "RECENT ADVANCES IN NATURAL LANGUAGE PROCESSING" (RANLP-2013)

The 9th International Conference "Recent Advances in Natural Language Processing" (RANLP-2013) was held on September 7-13, 2013 in Hissar, Bulgaria. The conference is a biennial event organised in Bulgaria since 1995 (http://www.lml.bas.bg/ranlp2013). The Programme Committee of the main conference RANLP-2013 consisted of 77 members. In addition, 111 reviewers took part in the review process of 186 submissions. The names of the PC members and reviewers can be found at http://lml.bas.bg/ranlp2013/programmeCommittee.php. All satellite events of RANLP (Student

Research Workshop and the three Workshops held on September 12-13, 2013) had separate Programme Committees which are shown at the respective event pages.

RANLP-2013 consisted of:

- Four tutorials given in 2 days (7-8 September 2013), with Programme shown at http://lml.bas.bg/ranlp2013/tutorials.php;
- Main conference (9-11 September 2013) with 6 invited talks, 60 oral presentations, 39 poster presentations, and a parallel Student Research Workshop with 4 oral presentations and 21 poster presentations; for more detail see the Programme at http://lml.bas.bg/ranlp2013/docs/programme_ranlp2013_03Sept-SITE.pdf

The Scientific Programmes of all RANLP events for 2013 are available at:

- http://lml.bas.bg/ranlp2013/tutorials.php (Tutoria)
- http://lml.bas.bg/ranlp2013/docs/programme_ranlp2013_03Sept-SITE.pdf (Main conference)
- http://lml.bas.bg/ranlp2013/workshops.php (Workshops)

The conference was attended by 151 participants (5 - from IICT-BAS, 13 - Bulgarian participants outside IICT-BAS, 141 - foreign participants, including 9 invited speakers - 6 of them supported via AComIn).

The invited lecturers, supported by AComIn, gave the following presentations:

- Iryna Gurevych and Judith Eckle-Kohler (Technical University Darmstadt): *"The Practitioner's Cookbook for Linked Lexical Resources"* - a tutorial held on 7 September 2013, 14.30-18.10;
- Violeta Seretan (University of Geneva): *"The Analytics of Word Sociology"* - a tutorial held on 7 September 2013, 9.30-13.10;
- Mark Stevenson (University of Sheffield): *"Large Scale Word Sense Disambiguation for the Biomedical Domain"* - an invited talk held on 9 September 2013, 14:30-15:30;
- Horacio Saggion (University Pompeu Fabra, Barcelona): *"Automatic Text Simplification: what for?"* - an invited talk held on 10 September 2013, 9:00-10:00;
- Iryna Gurevych (Technical University Darmstadt): *"Chasing the Crowd: Automatically Assessing the Quality of Content in Wikipedia"* - an invited talk held on 10 September 2013, 14:30-15:30;
- Nicoletta Calzolari (Institute of Computational Linguistics "Antonio Zampolli", Pisa): *"Policy Issues for Language Resources in the Data Era – the Challenges of Openness, Interoperability, Collaboration"* - an invited talk held on 11 September 2013, 9:00-10:00;
- Violeta Seretan (University of Geneva): *"Collocation Extraction Based on Syntactic Criteria"* - an invited talk held on 11 September 2013, 14:30-15:30.

All tutorials and invited talks concerned large-scale approaches to language technologies and comprehensive linguistic resources. The papers of the IICT experienced researchers, published with the support of AComIn, were presented with slides acknowledging the project within the Conference and Workshop sessions. Project leaflets were given to all conference participants as conference materials. The AComIn logo was visible at the RANLP-2013 site and all conference materials.

The RANLP-2013 Proceedings and the Proceedings of the Joint Workshop on NLP&LOD and SWAIE: Semantic Web, Linked Open Data and Information Extraction were uploaded in the SCOPUS indexed ACL Anthology – A Digital Archive of Research Papers in Computational Linguistics.

The support, provided by AComIn to RANLP-2013, enabled:

- To cover the travel expenses of numerous renowned keynote speakers and tutorial lecturers who presented various aspects of the "large-scale" trends in advanced Natural Language Processing. The participation of six keynote speakers at the conference was very important for the IICT seniors because in this way it became possible for the to listen to state-of-the-art presentations and establish fruitful contacts for further developments;
- To introduce the notion of "reduced fees" for conference participants from countries with lower standard. This concerned especially the student participation fees. Consequently many young people from the neighbouring countries, as well as from countries in the Middle East and North Africa, attended the conference. These young people might be future postdocs in AComIn and other IICT projects, and thus supporting their participation could pay off in later years.

All RANLP-2013 participants were informed about AComIn, its objectives and results, and the possibility to apply for postdoctoral positions in the project. This improves the image of IICT as a regional Centre of Excellence in language and semantic technologies.

List of AComIn-related published papers of IICT-BAS scientists

1. Nikolova, I., I. Temnikova and G. Angelova. Enriching Patent Search with External Keywords: a Feasibility Study. In Angelova, G., K. Bontcheva and R. Mitkov (Eds.), In: *Proceedings of RANLP-2013*, 525-531.
2. Temnikova, I., N. Hailu, G. Angelova and K. B. Cohen. Measuring Closure Properties of Patent Sublanguages. In Angelova, G., K. Bontcheva and R. Mitkov (Eds.), *Proceedings of RANLP-2013*, 659-666.
3. Temnikova, I., I. Nikolova, W. A. Baumgartner, G. Angelova and K. B. Cohen. Closure Properties of Bulgarian Clinical Text. In Angelova, G., K. Bontcheva and R. Mitkov (Eds.), Proceedings of RANLP-2013, 667-675.
4. Zhikov, V., G. Georgiev, K. Simov and P. Osenova. Combining POS Tagging, Dependency Parsing and Co-referential Resolution for Bulgarian. In Angelova, G., K. Bontcheva and R. Mitkov (Eds.), Proceedings of RANLP-2013, 755-762 .
5. Simov, K. Towards a System for Dynamic Language Resources in LOD. In Maynard, D., M. van Erp. B. Davis, P. Osenova, K. Simov, G. Georgiev and P. Nakov (Eds.), Proceedings of Joint Workshop on NLP&LOD and SWAIE: Semantic Web, Linked Open Data and Information Extraction, 2013, 16-22.

6.6. ACOMIN RELATED SCIENTIFIC SEMINARS

Numerous scientific seminars devoted to discussions of AComIn-related scientific topics are an important part of the project dissemination activities. These seminars were partly initiated by foreign experienced researchers who came to IICT-BAS for short or long-term visits. Some of them a listed below:

- 4 March 2013, Prof. Petrica C. Pop, Department of Mathematics and Computer Science, Technical University of Cluj-Napoca, North University Center of Baia Mare, Romania: Research trends in combinatorial optimization

- 7 March 2013, Prof. Petrica C. Pop, Department of Mathematics and Computer Science, Technical University of Cluj-Napoca, North University Center of Baia Mare, Romania: On the generalized vehicle routing problem.
- 15 May 2013, Prof. DSc Janusz Kacprzyk, Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland: Towards an extended Zadeh's Computing with Words.
- 21 May 2013, Prof. Franziska Kluegl, Örebro University, Sweden. Use of Multiagent Systems for Simulation.
- 21 May 2013, Dr. Ayyoob Jafari, Qazvin Islamic Azad University, Iran. Biomedical Signal Processing Experiences.
- 22 May 2013, Dr. Ayyoob Jafari, Qazvin Islamic Azad University, Iran. Speech Processing Experiences.
- 2 July 2013, Prof. Virginio Cantoni, University of Pavia, Italy, A Few Applications of Pattern Recognition Techniques to Proteomics.
- 7 August 2013, Prof. Lubomir Hadjiiski, Department of Radiology, University of Michigan, Ann Arbor, MI, USA. Can Intelligent Pattern Recognition help in Cancer Diagnosis and Treatment Response Monitoring?
- 1 October 2013, Prof. František Čapkovič, Institute of Informatics, Slovak Academy of Sciences: Modelling, Analyzing and Petri Net-Based Supervision of Agents in Complex Systems.
- 5 October 2013, Prof. Jacques Richalet, ADERSA, Paris, France: Predictive Functional Control.

The full list of AComIn related seminars and other scientific events can be found in http://iict.bas.bg/acomin/news.html.

Finally we note that the AComIn site contains no information about the weekly research seminars of the IICT departments which often deal with topics, related to AComIn. The project site encompasses only the events that are organised specifically for the project and by the project (in addition to the usual, everyday research tasks).

7. ACOMIN ELECTRONIC NEWSLETTERS

7.1. ACOMIN NEWSLETTER №1

AComIn Electronic Newsletter №1

Advanced Computing for Innovation

March 2013

AComIN's Mission: to strengthen the research and innovation capacity of the Institute of Information and Communication Technologies – BAS (IICT-BAS) by increasing the knowledge and skills of its researchers in emerging areas as well as by purchasing modern research infrastructure. AComIn should help the institute to successfully accomplish its strategic mission: by 2016, i.e. 5 years after its creation, IICT-BAS has to become a leading RTD Centre in Eastern Europe, providing facilities and working conditions comparable to the average standards of the EU Centres of Excellence in ICT. The institute will support the sustainable regional and national growth and employment by providing RTD results to advanced industrial organizations; it will be a focal point of high-quality research.

AComIn Work Packages

WP1: Strengthening the IICT_BAS Human Potential:

Organizing the recruitment of incoming experienced researchers via long-term and short-term employment. Integrating the activities of the incoming experienced researchers on long-term contracts into the every-day work of IICT-BAS: 7 three-year post-doc positions (3 – for Bulgarians and 4 – for foreigners) and 34 person months dedicated to employing top scientists on short term contracts (incoming experiences researchers with more than 10 years of scientific experience – both foreigners and Bulgarians)

WP2: Purchasing Smart Lab and building User Communities:

Organizing the procedure for purchasing the Smart Lab devices via public tenders. Full integration of Smart Lab in the IICT-BAS computational environment, ensuring its future use by publishing User Manuals and Guides of Exploitation. In order to effectively exploit the modern technologies provided by Smart Lab devices, User Communities will be organized, consisting of industrial experts (company representatives) who aim at applying AComIn results in industrial settings. They will consist of representatives of the innovation-absorbing Bulgarian companies and trade associations of branch industries that need a deeper expertise and scientific innovation in order to raise their competitive power. At least four User Communities are planned to be created in the following areas: a) 3D technologies; b) Speech processing; c) Microstructure dynamics and d) Advanced transportation systems.

WP3: Networking with leading EU partners:

Organization of two-way secondments and short visits between IICT-BAS and its partnering teams. Enabling the participation of IICT-BAS scientists at prestigious international conferences, international fairs/exhibitions, as well as Information, Partner-search and training events etc. organized in the EU. The work package is entirely directed at experienced IICT-BAS researchers.

WP4: Development of IP and KT Plan and Innovation Capacity Building:

Setting up IP policies and KT processes at IICT-BAS and harmonizing them with the European standards for transferring research results to industry.

Raising sufficient awareness among IICT-BAS's staff of the value of protecting its IP and of measures for early identification of IP Potential. Intensive training courses in IP management will be organized for IICT researchers.

WP5: Dissemination:

Organization of various activities for broad dissemination of AComIn results at the regional, national and international levels. Organization of regular cycles of Technology Transfer seminars, aimed at User Communities and promoting the potential of the advanced ICT applications and the Smart Lab devices. Three patent applications are expected to be submitted to the European Patent Office, based on novel AComIn results. Applications will be delivered to the Bulgarian Patent Office too. Books and monographs are planned to be published; 3 movies about AComIn will be produced for national and regional TVs; a tour in the country will be organized, in order to inform a wider audience of the potential of advanced ICT. The following events will be organized:

- 16 international scientific conferences and workshops in scientific areas such as: advanced computing, language and semantic technologies, signal and image processing, optimization and intelligent control
- 2 Information Days and 3 Doors Open Days in conjunction with Stock Exchange on Technology Transfer oriented towards User Communities and innovation-absorbing Bulgarian companies
- 5 cycles of User Communities seminars, carried out by top incoming researchers participating in the AComIn team

WP6: Assessment of IICT-BAS by independent international reviewers:

Assigning a 'quality label' to the research performance, human potential, infrastructure, administrative and management capacity of IICT-BAS.

Promotion of IICT-BAS as an excellent regional unit with the capacity to perform high-quality RTD activities in the context of large EU research projects, infrastructures and clusters with ICT components. Four independent reviewers will assess IICT-BAS's overall research quality and capacity after AComIn WP1-WP5 completion.

WP7: Management:

Planning, managing, coordinating, monitoring and controlling the AComIn activities by focusing on success criteria, risk minimization and quality assurance. Insuring the management of tender procedures for purchasing the Smart Lab devices, as well as managing the various dissemination activities.

SEVENTH FRAMEWORK PROGRAMME

AComIn:
Advanced Computing for Innovation
FP7-REGPOT-2012-2013
Grant Agreement: 315087
http://iict.bas.bg/acomin/index.html

Project Coordinator: Prof. Galia Angelova
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IICT
Institute of Information and Communication Technologies

AComIn Progress Report

Employed incoming post-docs

Dr. Irina Temelkova came to IICT-BAS from the University Wolverhampton, UK, where she obtained her PhD degree in 2012. Her research interests lie in the field of Computational linguistics, and more precisely in applications of Computational linguistics to solving real-life problems. As Irina said, she had been attracted to and very happy for being selected for a postdoctoral position at the Bulgarian Academy of Sciences for three reasons: - in the first place because she highly respects this institution, its research practices and history; because there was a very good match between the research direction proposed by Prof. Galia Angelova in the call for applications and Irina's research interests (extracting multilingual terminology from public websites), and finally because this allowed her to come back and work in Bulgaria and live with her family after years of separation. Irina went on by saying that she had been expecting, and has received very good treatment from the research group she is working for, and that she enjoyed the institution's highly intellectual environment. The aim of her research here is to complete a feasibility study for the applicability of online resources for collecting multilingual terminology and currently she is working on expanding patents search with terms from Wikipedia.

Dr. Jean Michel Sellier came to IICT-BAS from Pardue University, USA. He obtained his PhD degree in Mathematics (simulation of semiconductor devices) from the University of Catania, Italy. Jean Michel gained experience during his postdoc research on Plasma Simulations at Imperial College London, UK, and on Semi-classical Hydrodynamic Electron Transport models at INRIA, France. On the question "Why is he here?" Jean Michel answered: "Well, at some point of my life, I wanted to get back to Europe at the following two conditions: first, to have a salary, and second, to do something interesting in my life. I found the two conditions to be fulfilled here at the academy." In IICT-BAS Jean Michel is currently developing a Wigner Monte Carlo simulator for (the simulations of the) next generation nanodevices.

Dr. Stanislav Stoykov came to IICT-BAS from the University of Porto, Portugal, where he obtained his PhD degree in 2012. His research interests are in the area of nonlinear dynamics of structures, i.e. bifurcation theory, stability and chaos, but also in modeling of structures by finite element method and parallel solvers for solving the resulting large-scale systems. As he said, after completion of his PhD, he wanted to come back to Bulgaria, and continue his research in the same direction. The project AComIn gave him this opportunity and part of his current work is like a continuation of his PhD, but he is also studying and using new numerical techniques for solving large-scale systems. In IICT-BAS, on one part, he is extending the beam model developed in his PhD, i.e. he is deriving the equation of motion of tapered and initially twisted beams with arbitrary cross sections, by using the p-version FEM. On the other part, Stanislav is implementing the shooting and continuation methods, within Elmer software, and adopting these methods for parallel computations. This work will allow him to investigate the dynamics of any structure modeled by three-dimensional finite elements.

Short term incoming visits

In the period of 4-7 March 2013 IICT-BAS was visited by ***Professor Petrica Pop*** from the Department of Mathematics and Computer Science of Technical University of Cluj-Napoca, North University Center of Baia Mare, Romania. During his stay at IICT-BAS he had professional discussions with some leading Bulgarian scientists from the Department of Hierarchical Systems. Possible directions for future co-operative work have also been outlined.

Prof. Pop presented two lectures:

- *Research trends in Combinatorial Optimization* (5th March 2013)
- *On the Generalized Vehicle Routing Problem* (6th March 2013)

Outgoing secondments

In the period 03.03 – 23.03.2013 Prof. Krassimir Georgiev visited the Fraunhofer Institut für Techno- und Wirtschaftsmathematik (ITWM), Department of Flow and Material Simulation, Kaiserslautern, Germany, which is a partner in AComIn Project in Area 1: Advanced Computing and FEs applications. During his visit he had been working with the German colleagues in the field of mathematical and computer modeling of some convection-diffusion-reaction problems in porous media and their efficient implementation on parallel computers. He participated in discussions concerning the future joint research between two groups in the area of scientific computing and development of new supercomputer applications for industry, medicine and ecology and gave a talk at a seminar on „Scientific and Parallel Computing in IICT–BAS: Infrastructure, Projects, Results".

Upcoming events supported by AComIn

The 9th International Conference "Large-Scale Scientific Computations" (LSCC 2013) will be held on June 3-7 2013 at the Bulgarian Red Cross Educational Center in Sozopol - a picturesque town on the Black Sea coast, 36 km to the south from Burgas (the nearest international airport). Traditionally the Conference gathers researchers working on large scale computer simulations and high performance computer architectures and algorithms. The Conference Proceedings will be published as a special volume of Springer Lecture Notes in Computer Science (LNCS)

The 1st National Workshop "Information and Communication Technologies for Human Health and Quality of Life" (ICT-HuHeQuL-2013) will be held on May 15-17 2013 at hotel "Armira" in Stara Zagora Mineral Baths. The Workshop aims at demonstrating advances in ICT applications in improving human health and life quality. The selected papers will be published in a special issue of the IICT "Cybernetics and Information Technologies" journal.

Electronic version of this newsletter can be found in http://iict.bas.bg/acomin/docs/e-newsletters/E-Newsletter-no1.pdf.

AComIn Електронен бюлетин №1

Advanced Computing for Innovation

Март, 2013

Цели и задачи на проекта AcomIn: да се засили научният и иновационен потенциал на ИИКТ-БАН чрез назначаване на пристигащи от чужбина опитни изследователи, чрез увеличаване на знанията и уменията на неговите учени в актуални и нови научни области, както и чрез закупуване на модерно оборудване. Проектът ще позволи на ИИКТ да изпълни своята стратегическа мисия: до 2016, т.е. 5 години след създаването си, институтът би трябвало да се превърне във водещ научно-изследователски център в Централна и Източна Европа, който предоставя условия за работа, сравними със средните стандарти на Центровете за върхови постижения по ИКТ в ЕС. ИИКТ-БАН ще подпомага регионалния и национален растеж и откриването на нови работни места чрез предоставяне на научно-приложни резултати на високотехнологични индустриални организации. Институтът ще бъда център за висококачествено обучение на млади учени.

AcomIn: Работни Пакети

РП1: Увеличаване на човешкия потенциал на ИИКТ

Дългосрочно и краткосрочно назначаване на опитни изследователи (българи и чужденци), пристигащи от чуждестранни институции, седем 3-годишни позиции за пост-докторанти и 34 човеко-месеца за кратковременни назначения на хабилитирани лица (известни учени от целия свят). Интегриране на дейностите на пристигащите на дългосрочни договори опитни изследователи във всекидневната работа на ИИКТ-БАН.

РП2: Закупуване на Smart Lab и формиране на потребителски групи

Организиране на процедура за обществена поръчка за покупка на Smart Lab апаратура. Пълно интегриране на Smart Lab в изчислителната среда на ИИКТ-БАН и гарантиране бъдещото използване на лабораторията чрез публикуване на ръководства за употреба. За да могат да се използват ефективно модерните технологии, които Smart Lab предлага, ще бъдат организирани потребителски групи, съставени от експерти от индустрията (представители на иновативни компании), които имат нужда от по-дълбока експертиза и научна иновация с цел повишаване на конкурентноспособността си и имат за цел да приложат резултатите от AComIn в индустриална среда. Планирани са поне 4 потребителски групи в областите (а) 3D технологии, (б) обработка на реч, (в) микроструктурна динамика и (г) съвременни транспортни системи

РП3: Обмен с водещи партньори от ЕС

Организиране на двустранни специализации и кратки визити между ИИКТ-БАН и партньорските организации. Подпомагане участието на учени от ИИКТ-БАН в международни конференции, информационни събития, панаири, изложби и т.н., организирани от ЕС. Пакетът е изцяло ориентиран към опитните изследователи от ИИКТ-БАН.

РП4: Създаване на план за управление на интелектуалната собственост (ИС) и трансфера на знание и развитие на иновационнен потенциал

Създаване на правила за управление на ИС и процеси за трансфер на знание в ИИКТ, както и хармонизирането им с европейските стандарти за трансфер на научно-изследователски резултати в индустрията.

Повишаване на осведомеността сред персонала на ИИКТ-БАН относно защитата на ИС и мерките за ранно разпознаване на потенциал за ИС. Ще бъдат организирани интензивни курсове по управление на ИС за учените.

РП5: Разпространение

Организиране на множество дейности по разпространение на резултатите от проекта на регионално, национално и международно равнище. Организиране на регулярни цикли от семинари за технологичен трансфер, насочени към потребителските групи и популяризиране на потенциала на ИКТ приложенията и Smart Lab устройствата. Предвижда се да се подадат три заявления за патенти, базирани на резултати от AComIn в Европейския патентен офис, както и в Българското патентно ведомство. Ще бъдат публикувани книги и монографии; 3 научно-популярни филма за AComIn ще бъдат разпространени по телевизионните канали; ще се проведе турне в страната с цел запознаване на по-широката публика с потенциала на съвременните ИКТ. Следните събития ще бъдат организирани:

- 16 международни научни конференции и семинари в области като: съвременни пресмятания, езикови и семантични технологии, обработка на сигнали и изображения, оптимизация и интелигентен контрол,
- 2 Информационни дни и 3 Дни на отворените врати, съпътствани от Борса за технологичен трансфер, ориентирани към потребителски групи и иновативни български фирми,
- 5 цикъла от семинари за потребителските групи, изнасяни от водещи пристигащи от чужбина учени, участващи в AComIn.

РП6: Оценка на ИИКТ от независими чуждестранни експерти

Поставяне на „знак за качество" върху научната продукция, човешкия потенциал, инфраструктурата, административния и управленски капацитет на ИИКТ-БАН.

Признаване на ИИКТ-БАН за регионално звено за върхови постижения, с капацитета да извършва висококачествени научно-изследователски дейности в контекста на големи европейски проекти, инфраструктури и клъстери с ИКТ компоненти. Четирима независими експерти ще оценят цялостния научно-изследователски капацитет на ИИКТ-БАН след приключване на работни пакети 1-5.

РП7: Мениджмънт

Планиране, управление, координация, мониторинг и контрол на дейностите по AComIn с фокус върху критериите за успех, намаляване на риска и гаранция за качество. Мениджмънт на процедурите за обществени поръчки за покупка на Smart Lab апаратурата, както и управление на дейностите по разпространение.

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Междинен доклад за работата по проект AComIn

Назначени пост-докторанти

Др. Ирина Темникова пристига в ИИКТ-БАН от университета в Улвърхамптън, Обединено Кралство, където ѝ е присъдена докторка степен през 2012г. Научните ѝ интереси са в областта на изчислителната лингвистика и по-точно в приложенията на изчислителната лингвистика за решаване на задачи от реалния живот. Ирина казва че е много щастлива от назначението ѝ на пост-док позиция към БАН по три причини: на първо място, защото изключително много уважава институцията, научните ѝ практики и историята ѝ; защото научното направление, предложено ѝ от проф. Галя Ангелова в конкурса съответства на изследователските ѝ интереси и защото това ѝ е позволило да се завърне в България и да живее със семейството си след години на раздяла. Ирина разказва, че е получила много добро отношение от научния колектив, в който работи, и че се радва на високоинтелектуалната атмосфера в института. Целта на изследванията ѝ тук е to complete a feasibility study for the applicability of online resources for collecting multilingual terminology and currently she is working on expanding patents search with terms from the Wikipedia.

Др. Жан Мишел Селие пристига в ИИКТ-БАН от Университета Пардю, САЩ. Получава докторската си степен по математика (симулация на полупроводни устройства) от университета в Катаня. Жан-Мишел придобива опит по време на пост-докторските си изследвания по плазмени симулации в Imperial College, Лондон, и по полукласически хидродинамични модели за пренос на електрони в INRIA, Франция. На въпроса защо е тук, Жан-Мишел отговаря: „Ами, на някакъв етап от живота си исках да се върна в Европа при следните две условия: първо, да получавам добра заплата, и второ – да правя нещо интересно в живота си. И двете условия бяха изпълнени тук, в Академията." В ИИКТ Жан-Мишел работи заедно с проф. Иван Димов и по настоящем разработва Вигнер Монте Карло симулатор за (симулации на) нано-устройства от следващо поколение.

Др. Станислав Стойков пристига в ИИКТ-БАН от Университета в Порто, Португалия, където придобива докторската си степен през 2012г. Научните му интереси са в областта на нелинейна динамика на структури, т.е. теория на бифуркацията, устойчивост и хаос, но също така в моделиране на структури чрез метода на крайните елементи и паралелно решаване на големи системи линейни уравнения. Както сам казва, след завършване на дисертацията си, Станислав е искал да се завърне в България и да продължи изследванията си в същата насока. Проектът AComIn му дава тази възможност и част от сегашната му работа е нещо като продължение на дисертацията му, но той също така изследва и използва нови числени методи за решаване на големи системи уравнения. В ИИКТ-БАН работи заедно с проф. Светозар Маргенов. От една страна, Станислав is extending the beam model developed in his PhD, i.e. he is deriving the equation of motion of tapered and initially twisted beams with arbitrary cross sections, by using the p-version FEM. От друга страна, той is implementing the shooting and continuation methods, within Elmer software, and adopting these methods for parallel computations. This work will allow him to investigate the dynamics of any structure modeled by three-dimensional finite elements.

Краткосрочни визити в ИИКТ

В периода 4-7 март, 2013 г. ИИКТ-БАН беше посетен от професор Петрика Поп от Факултета по математика и информатика към Техническия Университет в Клуж-Напока, Румъния. По време на престоя си в ИИКТ-БАН проф. Поп проведе делови разговори с някои от водещите учени от ИИКТ. Начертани бяха и възможни насоки за бъдеща съвместна работа. Проф. Поп изнесе две лекции на теми:

- *Research trends in Combinatorial Optimization* (5 март 2013 г.)
- *On the Generalized Vehicle Routing Problem* (6 март 2013 г.)

Краткосрочни визити при партньори на AComIn

В периода 03.03-23.03.2013 г. проф. Красимир Георгиев посети Фраунхоферовия Институт за техническа и икономическа математика (ITWM), Department of Flow and Material Simulation, Кайзерслаутерн, който е партньор на проект AComIn в областта на съвременните изчисления. По време на посещението си, той работеше съвместно с немските си колеги в областта на математическото и компютърно моделиране на някои конвективно-дифузионни задачи, описващи реакции, протичащи в порести среди и тяхната ефективна реализация върху паралелни системи. Проф. Георгиев участваше в дискусии, засягащи бъдещи съвместни изследвания на двете групи в областта на научните пресмятания и разработването на нови суперкомпютърни приложения в индустрията, медицината и екологията и изнесе доклад на тема: "Scientific and Parallel Computing in IICT–BAS: Infrastructure, Projects, Results".

Предстоящи събития, частично спонсорирани от AComIn

9-а международна конференция "Large-Scale Scientific Computations" (LSCC 2013), ще се проведе на 03-07 юни, 2013г. в Учебния център на Българския Червен Кръст в Созопол. Традиционно, конференцията събира на едно място учени, работещи в областта на компютърните симулации и високопроизводителни изчислителни архитектури и алгоритми. Докладите от конференцията ще бъдат публикувани в отделен том на Springer Lecture Notes in Computer Science (LNCS).

Първи международен семинар "Информационни и комуникационни технологии за човешко здраве и качество на живот" ще се проведе на 15-17 май, 2013 г. в хотел „Армира", Старозагорски минерални бани. Семинарът е насочен към представяне на новости в приложенията на ИКТ за подобряване на здравето и качеството на живот. Избраните доклади ще бъдат публикувани в специално издание на едно от научните списания на ИИКТ: "Cybernetics and Information Technologies".

Electronic version of this newsletter can be found in http://iict.bas.bg/acomin/bg/docs/e-newsletters/E-Newsletter-no1.pdf.

7.2. ACOMIN NEWSLETTER №2

AComIn Newsletter №2

Advanced Computing for Innovation — *September 2013*

AComIn Mission: to strengthen the research and innovation capacity of the Institute of Information and Communication Technologies – Bulgarian Academy of Sciences (IICT-BAS) by increasing the knowledge and skills of its researchers in emerging areas as well as by purchasing modern research infrastructure. AComIn should help the institute to successfully accomplish its strategic mission: by 2016, i.e. 5 years after its creation, IICT-BAS has to become a leading RTD Centre in Eastern Europe, providing facilities and working conditions comparable to the average standards of the EU Centres of Excellence in ICT. The institute will support the sustainable regional and national growth and employment by providing RTD results to advanced industrial organisations; it will be a focal point of high-quality research and training in advanced ICT topics.

Progress Report (April - September 2013)

WP1: Strengthening the IICT-BAS Human Potential

Employed incoming post-docs

Dr. Clemens Hofreither was appointed to a post-doc position in IICT-BAS in August 2013. He defended his PhD thesis "A Non-standard Finite Element Method using Boundary Integral Operators" with distinction at the Doctoral College "Computational Mathematics" hosted at the Johannes Kepler University in Linz, Austria. He has developed a particular discretisation scheme for boundary value problems of elliptic partial differential equations and received interesting results on algebraic reconstruction methods for objects with non-homogeneous density by Radon projections. While working in IICT-BAS he will conduct research on advanced super-computing as well as on signal and image processing.

Dr. Ivan Georgiev was appointed to a post-doc position in IICT-BAS in September 2013. He came to Bulgaria from Johann Radon Institute of Computational and Applied Mathematics (RICAM) at the Austrian Academy of Sciences. His research interests are mostly related to efficient numerical solution methods for partial differential equations, solvers for systems resulting from non-standard finite element discretisations, robust with respect to anisotropy and coefficient heterogeneity. In the framework of the AComIn project he is going to work on the development and parallel implementation of the efficient multilevel preconditioning methods for problems with heterogeneous coefficients. Testing these methods with particular problems using the Smart Lab equipment is foreseen as well.

Short employments of incoming experienced researchers

Prof. Raytcho Lazarov came to IICT-BAS from Texas A&M University, College Station, USA. During his stay in the Institute (April 10 – May 10 2013) he conducted joint research with his local host, Prof. Svetozar Margenov, in the area of development, study, analysis and implementation of preconditioners for systems arising in FEM approximation of second order elliptic problems, describing processes in highly heterogeneous media. The developed approach uses the recently proposed preconditioning technique based on additive Schur complement approximation (ASCA). The theoretical study includes both mixed and least-squares finite element methods for self-adjoin second order problems. The robustness is achieved through special overlapping Schwarz procedure that also utilises some newly developed estimates for the Raviart-Thomas projection in weighted norms.

Prof. Lazarov also delivered an intensive course of lectures on Advanced Numerical Methods for partial differential equations, which is based on the contemporary concept of the inf-sup condition. The first part of the course consists of lectures presenting the basic tools for the analysis and the finite element constructions. The second part addresses advanced topics related to Stokes equations and relevant spaces that satisfy the infsup condition. The third part of the lectures covers some of the latest developments in the theory and practice of FEMs, namely, the discontinuous Galerkin method.

Prof. Lazarov took part in the organisation of a Special Session on "Modelling and Numerical Simulation of Processes in Highly Heterogeneous Media" at the 9th Conference on Large Scale Scientific Computing (LSSC'13), Sozopol, 3–7 June, 2013. The Session aimed at bringing together researchers working in the area of large scale simulation and computations of various processes in highly heterogeneous media. During the session 10 talks were presented.

Prof. Darina Dicheva and ***Prof. Christo Dichev*** came to IICT-BAS from Winston Salem State University, USA. The aim of their visit was to conduct joint research with their local hosts – Prof. Gennady Agre and Prof. Galia Angelova, in the area of applying semantic techniques for supporting educational systems and on the IT challenges in developing and using educational digital repositories. During their stay in the Institute (June 2013), a comprehensive review of the state of the art and the trends in K12 e-learning developments and practices around the world has been done. A special attention was given to the presentation of the main policies, supportive tools and research activities driving the steady progress in online learning in the US. State online learning practices and trends were examined for a number of other countries including Mexico, Canada, Australia, New

Zealand, India, Hong Kong, South Korea, China, and Singapore. E-learning in the European Union and its place in the Digital Agenda for Europe was considered as well as the current status of the introduction of K12 e-learning in Bulgaria. The trends in the next generation e-learning and virtual learning environments were the basis for outlining the research areas and technologies that need further development and advancing. The review was used as a basis for preparing the joint journal publication C. Dichev, D. Dicheva, G. Agre, G. Angelova "*Current Practices, Trends and Challenges in K-12 Online Learning*".

Prof. Dicheva and Prof. Dichev proposed jointly with the IICT seniors a methodological and evaluation framework for studying, analysing and assessing the needs and readiness for online learning in Bulgarian K-12 education system. Based on the suggested methodology a ***survey questionnaire*** has been developed, covering questions about the knowledge and skills of potential teachers, perceived barriers and facilitators, training needs as well as questions on the current status of the information and communication technologies in schools and their real use. The content of the questionnaire was discussed with stakeholders and aimed at collecting information from a diverse and representative audience. The survey results are intended to guide the design and implementation of online K-12 school platforms in Bulgaria by selecting implementation strategies designed to deal with the identified barriers and exploit facilitators.

Prof. Darina Dicheva and Prof. Christo Dichev delivered a set of lectures about improving content identification and search in educational digital repositories with a focus on using language and semantic technologies. They also discussed critical aspects for successful start of K-12 online learning and the role of a community of active supporters in the initial stage for advocating, promoting, sharing common experiences and providing feedback.

Prof. Milena Dobreva came to IICT-BAS from the University of Malta. She did joint research with her local hosts – Prof. Galia Angelova and Prof. Gennady Agre, on Language and Semantic Technologies with an emphasis on applications within digitalisation of, access to and preservation of cultural heritage; application of 3D models in this domain, and finally, synergies between access methods to digitalised cultural content and educational resources. During her stay in the Institute (June 18 – July 17 2013) Prof. Dobreva started to prepare a state-of-the-art review on using linked data technologies in digital cultural heritage repositories. Such a review would outline the advantages of linked data in the cultural heritage domain, scope current use with good practice examples, analyse the spread of development of current linked data applications and identify gaps in provision. Results of Prof. Dobreva's research on improving the user experiences in digital cultural heritage environments were presented at lectures entitled "*Methods of Studying Users of Digital Libraries*" and "*End Users and Digital Preservation: Challenges and Perspectives*". In order to establish an initial AComIn end-user community dealing with 3D cultural heritage objects, Prof. Dobreva had several meetings with the Director of Bansko Museum Complex and PhD students from the Department of Library and Information Studies of the Philosophical Faculty of Sofia University working on wider outreach for museum information, the use of mobile applications and QR codes.

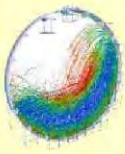
WP2: Purchasing Smart Lab and Building User Communities

In August 2013 a public tender for purchasing the AComIn equipment has been completed. Providing companies are selected for nine of the twelve specified devices. The equipment will be delivered by the end of November 2013. The following items are available in September 2013:

Laser Particle Sizer ANALYSETTE 22 Nano Tec plus - with a total measuring range of 0.01 – 2000 µm in a single instrument, the ANALYSETTE 22 NanoTec plus is the ideal, universally applicable Laser Particle Sizer for the effective and reliable determination of particle size distributions. The Sizer consists of 3 units – Measuring unit, Dry dispersion unit and Wed dispersion unit. Dry dispersion is ideal for dry, free-flowing and non-sticking materials. Especially coarse material can be measured with it very well and easily. The wet dispersion is suitable for almost all materials which do not dissolve in liquid. The advantage compared to the dry dispersion is the higher efficiency and greater flexibility of the dispersion process and the mostly very simple and comfortable handling.

Thermo ***Camera FLIR P640*** - this thermal imaging camera has an uncooled microbolometer detector that produces thermal images of 640 x 480 pixels. The model FLIR P640 has some very useful built-in features that make it ideal for predictive maintenance, such as a laser pointer, Picture in Picture and FLIR Thermal Fusion to merge the visual and the thermal image.

EDEM® Software for modelling and simulation - a computer-aided engineering platform powered by state-of-the-art Discrete Element Modelling technology, capable of generating the powerful simulations and analysis required to solve complex problems in the design, prototyping, and optimisation of bulk material handling and process equipment.



WP3: Networking with Leading EU Partners

Secondments

In March – April 2013, ***Dr. Yavor Vutov*** visited the Fraunhofer Institut für Techno- und Wirtschaftsmathematik (ITWM), Department of Flow and Material Simulation, Kaiserslautern, Germany for collaborative work on finite element and finite volume simulations. During his stay in ITWM he developed a surface reaction module added to a finite volume filter simulation, an adaptive timestepping scheme added to an unstructured 3D FEM solver and a numerical homogenisation tool for anisotropic linear elastic materials.

In the period May 13 – June 12 2013 ***Prof. Dimo Dimov*** visited the Computer Vision and Multimedia Lab (CVML) at the University of Pavia, Italy, which is a partner in the AComIn project. During his visit he was working with the Italian colleagues in the field of

Proteomics (Information approaches in proteins analysis). He has also discussed future joint research between the two groups in the area of application of the MV3R (Multi View Based 3D Recognition) method developed in IICT-BAS to a set of problems in Biometrics and/or Cultural heritage preservation. He gave 4 talks at seminars of the CVM Lab. The presentations are available at http://vision.unipv.it/events.

In the period September 14-29, 2013 ***Prof. Dimitar Karastoyanov***, ***Prof. Vladimir Monov*** and ***Prof. Lyubka Doukovska*** visited the University of Örebro, Sweden - one of the IICT-BAS partners in the AComIn project. They gave talks in a seminar with the attendance of scientists from the School of Science and Technology and the Centre for Applied Autonomous Sensor Systems (AASS), where they presented current results from the project AComIn, as well as results and research activities of the IICT-BAS departments "Embedded Intelligent Technologies", "Modeling and Optimisation" and "Intelligent Systems". Working meetings and discussions about future joint tasks were also carried out with Prof. I. Kalaykov, contact person in the partnership with the Örebro University, Prof. D. Driankov, Director of the Centre AASS, Prof. Franziska Kluegl and Prof. Anani Ananiev.

Incoming short visits

Prof. Franziska Kluegl from the University of Örebro, Sweden visited IICT-BAS in the period May 20-23, 2013. During her stay she had meetings and discussions with leading scientists from the "Modelling and Optimisation" and "Intelligent Systems" Departments. Prof. Kluegl presented a lecture "Use of Multiagent Systems for Simulation" (May 21, 2013).

In the period June 26 – July 4 2013 IICT-BAS was visited by ***Prof. Virginio Cantoni*** from the Computer Vision and Multimedia Lab of the University of Pavia, Italy. During his stay at IICT-BAS he had professional discussions with leading IICT seniors from the Department of Signal

Processing and Pattern Recognition. Possible directions for future co-operative work have been also outlined. Prof. Cantoni gave the talk "*A Few Applications of Pattern Recognition Techniques to Proteomics*" (July 2, 2013). The presentation is available at http://iict.bas.bg/acomin/news.html.

Participations at scientific events

During the last 6 months 29 scientists from IICT-BAS presented 52 talks about their research results that were partially funded by the AComIn project at 28 International Conferences and Workshops held in 13 European countries.

WP4: Development of Innovation Policy and Knowledge Transfer Plan and Innovation Capacity Building

On April 18, 2013 IICT-BAS and the Joint Innovation Centre of BAS organised a ***Seminar on Intellectual Property issues*** with presentations on *Protection of IP* (**Dr. Georgi Dimitrov**) and *Authorship and Patents* (**Mrs. Plamena Georgieva**).

In the period July 9-12, 2013 IICT-BAS was visited by ***Dr. Frank Heemskerk*** from Research and Innovation Management Services, Belgium, an external AComIn consultant in Innovation capacity development. Dr. Heemskerk had several meetings with the IICT key staff, where the draft IICT Innovation strategy has been discussed. Dr. Heemskerk also visited the Headquarters of BAS and had a meeting with the BAS Vice-President Corr. Mem. Nikolay Miloshev, where the BAS IP Policy has been discussed. During his stay in Bulgaria Dr. Heemskerk presented a cycle of lectures on different IP issues:

- *Exploitation of research results: European practices, expectations and trends (10.07.2013),*
- *Exploitation of research results: how to create impact, project examples and cases (10.07.2013),*
- *Developing Innovation Capacity in a globalised world: how to bring competences together (11.07.2013),*
- *Developing Innovation Capacity in a globalised world: examples of organisational structures to support Innovation (11.07.2013),*
- *Innovation in Horizon 2020 – towards a seamless link between research, innovation and society challenges (12.07.2013).*

On June 25, 2013 IICT-BAS received from the National Patent Office the ***registration of industrial design of devices for night viewing*** (№7826/25.06.2013 and №7827/25.06.2013) with authors: B. Bantutova, D. Borissova, E. Bantutov, I. Mustakerov. The night vision devices are designed for security reasons and early warning of natural disasters and emergency. They can be used in research as well.

WP5: Dissemination

Scientific events supported by AComIn

The 9th International Conference "Large-Scale Scientific Computations" (LSCC 2013) was held on June 3-7, 2013 in Sozopol, Bulgaria. The Conference gathered 154 researchers (44 of them from Bulgaria) working on large scale computer simulations and high performance computer architectures and algorithms. A wide range of recent achievements in the field of scalable numerical methods, algorithms and their applications have been addressed during the conference. The meeting provided a forum for exchange of ideas between scientists, who develop and study numerical methods and algorithms, and researchers, who apply them for solving real life problems. The following major scientific topics, all related to the AComIn project activities have been included: Hierarchical, adaptive, domain decomposition and local refinement methods; Robust preconditioning algorithms; Monte Carlo methods and algorithms; Numerical linear algebra; Control systems; Large-scale computations of environmental biomedical and engineering problems; High-performance algorithms for engineering problems; Parallel algorithms and performance analysis. The Scientific Programme of the event included 5 Plenary Invited talks, 11 Special Sessions and Sessions of Contributed Talks. Six of the Special Sessions are directly related to the AComIn project activities. The Conference Proceedings will be published as a special volume of Springer Lecture Notes in Computer Science (LNCS) and will contain 10 AComIn related papers.

The 1st National Workshop "Information and Communication Technologies for Human Health and Quality of Life" (ICT-HuHeQuL2013) was held on May 15-17 2013 in Stara Zagora, Bulgaria. The discussed topics ranged from theoretical considerations of modelling and simulation approaches to demonstration of application prototypes that can be used in healthcare decision making, ambient assisted living, orthopaedic surgery, quality preservation of foods etc. The workshop was attended by 42 participants (14 from IICT-BAS, 5 invited lecturers, 5 participants from companies, 8 from various academic organisations, and 10 local experts leading or working in regional institutions). 22 talks were given in the following topics: ICT for Human Health – 6 presentations, ICT for Quality of Life – 6 presentations, ICT in Medical Robotics – 5 presentations and ICT for Healthy Food – 5 presentations. Four papers presented at the Workshop have been published in "Bulgarian Journal of Agricultural Science" and another four papers will appear in the journal "Cybernetics and Information Technology" published by IICT-BAS.

The 9th International Conference "Recent Advances in Natural Language processing" (RANLP 2013) was held on September 7-13, 2013 in Hissar, Bulgaria. The RANLP events, organised biennially in Bulgaria, consist of two days of tutorials, main conference of three days and post-conference workshops held in two days. In 2013 the focus was on large scale technologies, which adjusts the event to the AComIn perspective. Four tutorials were given on 7-8 September, discussing automatic processing of Wikipedia and scalable approaches for discovering phrasal expressions and semantic relations. The main conference (9-11 September) had 6 invited talks, 60 oral presentations, 39 poster presentations, and a parallel Student Research Workshop with 4 oral presentations and 21 posters. The Workshops held on 12-13 September included 4 invited talks and 21 oral presentations. The event had 159 participants, 18 of them from Bulgaria (5 from IICT-BAS). The invited lecturers, supported by AComIn, gave keynote lectures on large scale word sense disambiguation, automatic assessment of the Wikipedia content, policy issues for language resources in the data era, automatic text simplification, and automatic collocation extraction. The conference and workshop Proceedings are uploaded as usual in the Digital repository of the Association for Computational Linguistics (*ACL Anthology*). They contain 5 AComIn related papers.

Upcoming events supported by AComIn

International Workshop "Autonomic Computing and Automatic Control in Computer Systems" (ACACCS), a co-event of the International Conference "Automatics and Informatics 2013", October 3-7, 2013, Sofia, Bulgaria. The Workshop aims at demonstrating the potential the of AComIn project results for developing autonomic computing and automatic control in computer systems. Selected papers will be published in a special issue of the "Cybernetics and Information Technologies" journal.

Workshop "ICT for New Materials and Nanotechnologies" is a co-event of the Int. Conference "Robotics, Automation and Mechatronics" RAM 2013, October 8-10, Bankya, Bulgaria. The Workshop aims at demonstrating advances in applications of ICT for new materials and nanotechnologies. Selected papers will be published in a special issue of the "Cybernetics and Information Technologies" journal.

The 1st AComIn Technology Transfer Seminar on Computational Vision Applied to Medical Diagnosis

Lecturer: **Prof. Petia Radeva – University of Barcelona, Spain**

Dr. Petia Radeva is a Senior Researcher and Associate Professor at the University of Barcelona. She is Head of Barcelona Perceptual Computing Laboratory and Head of MiLab of Computer Vision Center (*www.cvc.uab.es*). Her present research interests are on development of learning-based approaches (in particular, statistical methods) for computer vision and image processing. She has led or leads more than 15 projects (European, international and national projects), and 19 technology transfer projects with Spanish, American and Israelian companies. She has 15 patents in the field of computer vision, image processing and medical imaging. Some of the projects she is currently heading are: Machine learning tools for large scale object recognition, Audience measurements by Computer Vision, Evaluation of Intestinal Motility by Endoluminal Image Analysis, Sponsored Research Agreement on Automatic Stent Detection in IVUS, Study for the development of a polyp detection algorithm under a Polyp Detection, etc.

The Seminar Programme:

July 24th: 14.00 – 18.00 h:

Introduction: Computer Vision in Barcelona University;

Segmentation techniques:

- Snakes and level sets;
- Graph-cuts.

July 25th: 10.00 – 13.00 h:

Image context analysis:

- Shape context;
- Active shape models and Active appearance models;
- Bayesian context modelling.

July 25th: 14.00 – 18.00 h:

Applications to medical diagnosis and treatment – two real clinical projects:

- Introduction to Medical imaging;
- Arteriosclerotic plaque analysis in intravascular ultrasound images of coronary vessels;
- Stent detection.

July 26th: 10.00 – 13.00 h:

Neuroimaging;

Intestinal motility analysis in wireless endoscopic images

The seminar was held from 24 to 26 July 2013 as a 14-hours course and brought together 33 participants from four private companies (MMSolutions AD, 3PS-SIMULIA, AVIQ Bulgaria Ltd., and Vitronic GmbH), two Bulgarian universities (Technical University of Sofia and Technical University of Veliko Tarnovo), seventeen participants from IICT-BAS, as well as representatives from six other institutes of the Bulgarian Academy of Sciences. The presentations of the lectures are freely accessible at the AComIn project site (http://iict.bas.bg/acomin/news.html).

SEVENTH FRAMEWORK PROGRAMME

AComIn
Advanced Computing for Innovation
FP7-REGPOT-2012-2013
Grant Agreement: 315087
http://iict.bas.bg/acomin/index.html

Project Coordinator: Prof. Galia Angelova
Institute of Information and Communication Technologies, Bulgarian Academy of Sciences
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tel. +3592 979 6607
e-mail: acomin@bas.bg

IICT
Institute of Information and Communication Technologies

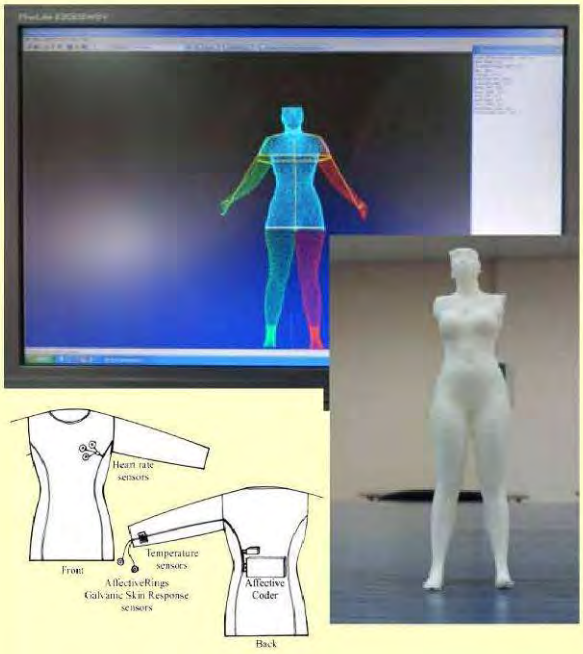
The 1st AComIn Technology Transfer Seminar on Applying Advance 3D Technologies in the Textile Industry and Fashion

Lecturer: **Dr. Petar Gulev - the London School of Fashion, University of the Arts, London, UK**

Dr. Gulev is a computer scientist, who graduated from the Technical University in Sofia. He holds a PhD degree from the Imperial College in London, UK and has gained scientific experience in the London School of Fashion in the University of the Arts – London. The seminar took place in IICT-BAS in the period September 2 – 5, 2013. The event was organised with the help and support of:

- **The British Council,** which policy includes continuous wide-ranging support for carrying out lectures in Bulgaria by specialists, who have obtained scientific degrees in Great Britain, and
- **The Ministry of Education and Science** of the Republic of Bulgaria, which provides facilities and competent technical support for conducting cutting edge technology trainings in Bulgaria.

Dr. Petar Gulev made the participants familiar with the current scientific and technological advancements in the textile industry and fashion during a course, named: "Applying advanced 3D computer technologies in the textile industry and fashion". The focus fell on approaches for user opinion research, scanning and creating 3D models of the human body, 3D design of cloths and accessories, as well as using 3D models in electronic trade in the fashion industry. Dr. Gulev also presented an innovative concept, developed together with Lisa Stead - "*Computer Aided Emotional fashion*", a real time platform termed AfectiveWare, creating clothing that is personalised by the emotions of the individual. The list of attendees included company owners and managers from the textile industry, fashion designers, university professors and teachers in specialised secondary schools.



Leading Bulgarian companies in the field of 3D technologies were involved in the seminar upon the speaker's invitation: 3d Print – Bulgaria (http://www.3dprint-bg.com) demonstrated the creation of 3D objects in real time using MakerBotReplicator2 and environmentally clean corn pre-products, and Team Ltd (Team ООД, http://www.team.bg) provided software for a manual 3D scanner ZScanner 800 for scanning textile objects and human shapes in real time. The seminar gathered 22 participants.

SEVENTH FRAMEWORK PROGRAMME

AComIn
Advanced Computing for Innovation
FP7-REGPOT-2012-2013
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Project Coordinator: Prof. Galia Angelova
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IICT
Institute of Information and Communication Technologies

Electronic version of this newsletter can be found in http://iict.bas.bg/acomin/docs/e-newsletters/E-Newsletter-no2.pdf.

AComIn Бюлетин №2

Advanced Computing for Innovation — *Септември 2013*

Цели и задачи на проекта AcomIn: да се засили научният и иновационен потенциал на ИИКТ-БАН чрез назначаване на пристигащи от чужбина опитни изследователи, чрез увеличаване на знанията и уменията на неговите учени в актуални и нови научни области, както и чрез закупуване на модерно оборудване. Проектът ще позволи на ИИКТ да изпълни своята стратегическа мисия: до 2016, т.е. 5 години след създаването си, институтът би трябвало да се превърне във водещ научно-изследователски център в Централна и Източна Европа, който предоставя условия за работа, сравними със средните стандарти на Центровете за върхови постижения по ИКТ в ЕС. ИИКТ-БАН ще подпомага регионалния и национален растеж и откриването на нови работни места чрез предоставяне на научно-приложни резултати на високотехнологични индустриални организации. Институтът ще бъде център за висококачествено обучение на млади учени.

Дейности по Работни пакети (април - септември 2013)

РП1: Увеличаване на човешкия потенциал на ИИКТ

Назначени пост-докторанти

Д-р Клеменс Хофрайтер е назначен на пост-докторска позиция в ИИКТ-БАН през август 2013 г. Той защитава с отличие докторската си дисертация „Нестандартен метод на крайните елементи, използващ гранични интегрални оператори" в Института по изчислителна математика към Университета "Йоханес Кеплер" в Линц, Австрия. Д-р Хофрайтер е разработил специална схема за дискретизация на елиптични гранични задачи и е получил интересни резултати, свързани с алгебрични методи за реконструкция на обекти с нехомогенна плътност чрез използване на проекциите на Радон. По време на работата си в ИИКТ-БАН, той ще извършва изследвания в областта на съвременните научни пресмятания, както и на обработката на сигнали и изображения.

Д-р Иван Георгиев е назначен на пост-докторска позиция в ИИКТ-БАН през септември 2013 г. Той се връща в България от специализация в Института по изчислителна и приложна математика "Йохан Радон" (RICAM) към Австрийската академия на науките. Научните му интереси са свързани най-вече с ефективни методи за числени решения на частни диференциални уравнения и системи с нестандартна дискретизация на крайни елементи, робастни по отношение на анизотропията и хетерогентността на коефициенти. Предвижда се тестване на тези методи с използване на оборудването в AComIn.

Краткосрочни назначения на гостуващи учени

Проф. Райчо Лазаров пристига в ИИКТ-БАН от Texas A&M University, College Station, САЩ. По време на неговия престой в ИИКТ-БАН (10 април – 10 май 2013 г.) съвместно с проф. Светозар Маргенов бяха извършени изследвания в областта на развитието, анализа и използването на преобусловители за системи уравнения, получаващи се при дискретизация по метода на крайните елементи (МКЕ) на елиптични задачи от втори ред, описващи процеси, протичащи в силно хетерогенни среди. Приложеният подход използва предложената техника на преобуславяне на основата на адитивна апроксимация на допълнението на Schur. Теоретичните изследвания включват както смесения метод на крайните елементи, така и метода на най-малките квадрати за самоспрегнати задачи от втори ред. Робастността на алгоритмите е постигната чрез специална процедура на Шварц с препокриване, като се използват някои нови оценки за проекцията на Raviart-Thomas в норми с тегла. Проф. Лазаров изнесе и интензивен курс лекции по съвременни числени методи за частни диференциални уравнения, основани върху съвременната концепция за условието inf-sup. Първата част от курса въвежда основните инструменти за анализа и конструирането на крайните елементи. Втората част разглежда съвременни теми, свързани с уравнения на Стокс и релевантните пространства, които удовлетворяват условието inf-sup. Третата част представя последни достижения в теорията и приложенията на метода на крайните елементи, а именно прекъснатия метод на Галеркин.

Проф. Лазаров взе участие в организацията на специална сесия "Моделиране и числени симулации на процеси, протичащи в силно хетерогенни среди" по време на 9-ата Международна конференция "Large-Scale Scientific Computations" (LSCC'13) в Созопол, 3-7 юни 2013 г., където бяха представени 10 доклада.

Проф. Дарина Дичева и проф. Христо Дичев пристигат в ИИКТ-БАН от Winston Salem State University, САЩ. Целта на посещението им беше съвместно с доц. Геннадий Агре и проф. Галя Ангелова да извършат научни изследвания в областта на приложението на семантичните технологии в образованието, както и върху предизвикателствата пред развитието и използването на образователни цифрови хранилища. По време на престоя им в института (юни 2013 г.), беше извършен обстоен преглед на върховите постижения и тенденциите в областта на електронното обучение в средното образование. Специално внимание беше обърнато върху

основните политики, подходи и научноизследователски дейности, прилагани при онлайн обучението в САЩ. Бяха изследвани практики и тенденции в редица държави, включително Мексико, Канада, Австралия, Нова Зеландия, Индия, Хонг Конг, Южна Корея, Китай и Сингапур. Разгледано беше и електронното образование в Европейския Съюз, мястото му в Европейската стратегия за цифрови технологии, както и настоящото състояние на електронното образование в България. Тенденциите в електронното образование и виртуалните обучителни среди от следващо поколение бяха използвани като основа за очертаване на изследователските области и технологии, които следва да се доразвият у нас. Въз основа на обзора беше подготвена съвместна публикация: C. Dichev, D. Dicheva, G. Agre, G. Angelova "Current Practices, Trends and Challenges in K-12 Online Learning".

Заедно с учени от ИИКТ-БАН проф. Дичева и проф. Дичев предложиха методологическа рамка за изследване, анализ и оценка на нуждите и готовността за онлайн обучение в българската система за средно образование. Въз основа на предложената методология беше разработен анкетен въпросник, свързан със знанията и уменията на преподавателите, както и на потенциални пречки и средства за преодоляването им, за нуждите на обучителния процес, както и въпроси, свързани с текущото състояние на ИКТ в училищата и реалната им употреба. Съдържанието на въпросника, което беше обсъдено със заинтересованите страни, е насочено към събиране на информация от максимално широка и представителна аудитория. Предвидено е резултатите от анкетата да се използват за създаване и внедряване на електронни платформи за обучение в средните училища в България чрез избор на стратегии, които да преодолеят установените пречки.

Проф. Дарина Дичева и проф. Христо Дичев изнесоха и цикъл лекции, посветени на търсене в образователните електронни хранилища, с фокус върху използване на езикови и семантични технологии. В тях бяха обсъдени и важните аспекти, необходими за успешното прилагане на електронно обучение в средно образование.

Проф. Милена Добрева пристига в ИИКТ-БАН от Университета в Малта. Заедно с проф. Галя Ангелова и доц. Геннадий Агре тя извърши научни изследвания в областта на езиковите и семантични технологии с акцент върху приложенията им за цифровизацията, достъпа и запазването на културно наследство; приложение на 3D модели в тази област, както и на синергия между методите за достъп до цифровизирано културно съдържание и образователни ресурси. По време на престоя си в института (18 юни – 17 юли 2013 г.), проф. Добрева започна да подготвя аналитичен обзор за използването на технологията на свързаните данни в цифровите хранилища за културно наследство. Обзорът ще очертае предимствата на технологията, като ще обхване съществуващите начини на използване с примери на добри практики, ще анализира обхвата и развитието на приложения на тази технология и ще

идентифицира възникващи проблеми. Резултатите от изследванията на проф. Добрева за подобряване на опита на потребителите по използване на цифрови среди, свързани с културно наследство, бяха представени в лекциите: "Methods of Studying Users of Digital Libraries" и "End Users and Digital Preservation: Challenges and Perspectives". С цел да се създаде ядро на група от крайни потребители на триизмерни обекти на културно наследство, свързана с проект AComIn, проф. Добрева проведе срещи с директора на Музейния комплекс в Банско и докторанти от Катедрата по библиотечно-информационни науки към Философския факултет на Софийския Университет, работещи върху разширяването на обхвата на музейната информация, употребата на мобилни приложения и QR кодове.

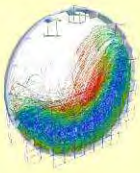
РП2: Закупуване на интелигентна периферия за Smart Lab и формиране на Потребителски групи

През август 2013 г. беше завършена процедура за обществена поръчка по закупуване на оборудване по проект AComIn. Бяха избрани доставчици за девет от общо дванадесет устройства. Оборудването ще бъде доставено до края на ноември 2013 г. Следните уреди са достъпни в ИИКТ-БАН през септември 2013 г:

Лазерен измерител на частици ANALYSETTE 22 Nano Tec с обхват на измерване от 10 nm до 2000 μm на единично измерване. Това е универсално средство за ефективно и достоверно определяне на размера на частици. Измерителят се състои от 3 части: измервателен модул, модул за суха дисперсия и модул за мокра дисперсия. Сухата дисперсия е подходяща за свободно движещи се, насипни материали и незалепващи материали. По този начин могат лесно да се измерват материали с необработена и много грапава повърхност, които се разтварят във вода. Мократа дисперсия е подходяща за почти всички материали, неразтворими в течност. Предимството в сравнение със сухата дисперсия е по-високата ефективност и гъвкавост на процеса на разпръскване, както и простото и удобно боравене с уреда.

Инфрачервената Камера Flir P640 за неконтактно термографиране е снабдена с микроболометър, който създава термални изображения с качество 640x480 пиксела. Моделът разполага с някои много полезни вградени функции, които го правят идеален за работа с целия термален образ, за използване като лазерен пойнтер и като Picture in Picture и FLIR Thermal Fusion устройство за съвместяне на зрителното и термалното изображения.

Софтуерен пакет EDEM® за моделиране и симулации - компютърно-подпомогната инженерна платформа, базирана върху моделиране по метода на дискретните елементи, способна да създава големи симулации и среди за анализ, които са необходими за решаване на сложни задачи при проектирането, разработката на прототипи и оптимизацията на обработваща апаратура за насипни материали.



РП3: Обмен с водещи партньори от ЕС

Командировки

През март-април 2013 г. ***д-р Явор Вутов*** посети Фраунхоферовия институт по техническа и икономическа математика (ITWM), Кайзерслаутерн, Германия, където извърши съвместна научни изследвания с използване на метода на крайните елементи. По време на престоя си в ITWM той разработи модул за симулация на повърхностни реакции към система за симулация на филтри с крайни обеми, реализира адаптивна стъпка по времето в система за тримерни крайноелементни симулации върху неструктурирани мрежи и разработи програма за числена хомогенизация на анизотропни линейно-еластични материали.

В периода 13 май – 12 юни 2013 г. ***доц. Димо Димов*** посети Лабораторията по Компютърно Зрение и Мултимедия (CVML) на Университета в Павия, Италия - партньор по проект AComIn. По време на посещението си той работеше заедно с италианските си колеги в областта на протеомиката (информационни подходи към анализ на протеини). Доц. Димов обсъди също и възможности за бъдещи съвместни изследвания на двете групи, насочени към приложения на метода MV3R (Multi View Based 3D Recognition), разработен в ИИКТ-БАН, към задачи от областта на биометриката и/или запазването на културно наследство. По време на семинари на Лабораторията той изнесе 4 доклада, текстове на които са достъпни на следния адрес: *http://vision.unipv.it/events*.

В периода 14-29 септември 2013 г., ***проф. Димитър Карастоянов, доц. Владимир Монов и доц. Любка Дуковска*** посетиха университета в Йоребро, Швеция – един от партньорите на ИИКТ-БАН в проект AComIn. Те изнесоха доклади на семинар пред учени от Департамента по науки и технологии и от Центъра по Приложни Автономни Сензорни Системи (AASS), където представиха текущите резултати по проект AComIn, както и резултати и научни дейности на секциите „Вградени интелигентни технологии", „Моделиране и оптимизация" и „Интелигентни системи" от ИИКТ. Бяха проведени работни срещи и дискусии относно бъдещи съвместни задачи с проф. Калайков от Университета в Йоребро, с проф. Д. Дрянков – директор на Център AASS, проф. Франциска Клюгъл и проф. Анани Ананиев.

Краткосрочни посещения в ИИКТ-БАН

Проф. Франциска Клюгл от Университета в Йоребро, Швеция посети ИИКТ-БАН в периода 20-23 май, 2013 г. По време на престоя си тя проведе срещи и дискусии с водещи учени от секциите „Моделиране и оптимизация" и „Интелигентни системи". Проф. Клюгъл изнесе лекция на тема: „Use of Multiagent Systems for Simulations" (21 май 2013 г.)

В периода 26 юни – 4 юли 2013 г. ИИКТ-БАН беше посетен от ***проф. Вирджинио Кантони*** от Лабораторията по компютърно зрение и мултимедия .към Университета в Павия, Италия. По време на посещението си той проведе професионални дискусии с водещи учени от Секцията по обработка на сигнали и разпознаване на образи. Бяха очертани насоки за бъдеща съвместна работа. Проф. Кантони изнесе доклад на тема: „A Few Applications of Pattern Recognition Techniques to Proteomics." Презентацията се намира на: *http://iict.bas.bg/acomin/news.html*.

Участия в научни събития

През последните шест месеца 29 учени от ИИКТ-БАН изнесоха 52 доклада на 28 международни конференции, проведени в 13 европейски държави, с цел представяне на постигнатите от тях резултати, частично финансирани по проект AComIn.

РП4: Създаване на план за управление на интелектуалната собственост, трансфера на знание и развитие на иновационнен потенциал

На 18 април 2013 г. ИИКТ и Единният център за иновации на БАН организираха семинар ***„Аспекти на интелектуалната собственост"***, включващ презентациите „Защита на Интелектуалната собственост" (доц. д-р Георги Димитров) и „Авторство и патенти" (адвокат Пламена Георгиева).

В периода 9-12 юли 2013 г. ИИКТ-БАН беше посетен от ***д-р Франк Хеемскерк*** от Research and Innovation Management Services, Белгия – външен консултант на AComIn по развитие на иновационен потенциал. Д-р Хеемскерк проведе няколко срещи с водещи учени от ИИКТ, на които беше обсъден проектът за Иновационна стратегия на института. Д-р Хеемскерк посети също и Централно управление на БАН, където се срещна със зам-председателя на БАН – чл. кор. Николай Милошев. По време на престоя си в България д-р

Хеемскерк представи цикъл от лекции, посветени на различни аспекти на иновационната политика:

- *Използване на научноизследователски резултати: европейски практики, очаквания и тенденции,*
- *Използване на научноизследователски резултати: как се създава въздействие в обществото на базата на примери и случаи от проекти;*
- *Развитие на иновативен капацитет в един глобализиран свят: как да се съчетаят компетенции от различни области,*
- *Развитие на иновативен капацитет в един глобализиран свят: примери на организационни структури в подкрепа на иновациите,*
- *Иновациите в Хоризонт 2020 – към постоянна връзка между наука, иновации и обществено-значими проблеми.*

На 25 юни ИИКТ-БАН получи от Патентното ведомство на Република България ***регистрация на промишлен дизайн на приспособления за нощно гледане*** (№7826/25.06.2013 и №7827/25.06.2013) с автори: Б. Бантутова, Д. Борисова, Е. Бантутов, И. Мустакеров. Приспособленията за нощно гледане са проектирани да послужат за нуждите на сигурността и за ранна сигнализация при природни бедствия и аварии.

РП5: Разпространение на резултатите

Научни събития, подпомогнати от AComIn

9-ата Международна конференция "Large-Scale Scientific Computations" (LSCC 2013) се проведе на 3-7 юни 2013 г. в Созопол. Конференцията събра 154 учени (44 от тях – от България), работещи в областта на компютърните симулации и високопроизводителните изчислителни архитектури и алгоритми. На конференцията бяха обсъдени последните постижения в областта на скалируемите числени методи и алгоритми, както и тяхното приложение. Събитието предостави форум за обмен на идеи между учени, които разработват и изследват числени методи и алгоритми, и изследователи, които ги прилагат за решаване на задачи от заобикалящия ни свят. Научната програма включваше 5 пленарни доклада, 11 сесии с доклади и специални сесии. Шест от специалните сесии бяха пряко свързани с дейностите по проект AComIn. Трудовете от конференцията, сред които 10, свързани с тематиката по проект AComIn, ще бъдат публикувани в отделен том на Springer Lecture Notes in Computer Science (LNCS).

Първият национален семинар "Информационни и комуникационни технологии за човешко здраве и качество на живот" (ICT-HuHeQuL2013) се проведе на 15-16 май 2013 г. в Стара Загора. Разглежданите теми варираха от теоретичните възможности на методите за моделиране и симулации до демонстрации на прототипи на приложния, които могат да се използват в областта на вземане на решения в здравеопазването, ортопедична хирургия, качествено запазване на храни и др. В Семинара участваха 42 души (14 от ИИКТ-БАН, 5 поканени лектори, 5 участници от частни фирми, 8 от различни научни организации и 10 местни експерти, оглавяващи или работещи в регионални институции). Бяха изнесени 22 доклада. Разширените варианти на 4 доклада бяха публикувани в списание "Bulgarian Journal of Agricultural Science", а други четири ще се появят в списание "Cybernetics and Information Technology", издавано от ИИКТ-БАН.

9-та Международна конференция „Съвременни достижения в обработката на естествен език" (RANLP 2013) се проведе в Хисаря на 7-13 септември 2013 г. В периода 7-8 септември се проведоха четири обучаващи курса (tutorials), свързани с автоматичната обработка на Wikipedia и скалируеми подходи за откриване на фразеологични изрази и семантични релации. Основната конференция (9-11 септември) включваше 6 пленарни доклада, 60 устни презентации, 39 постера и паралелно провеждащ се докторантски семинар с 4 доклада и 21 постера. Семинарите, проведени на 12-13 септември, включваха 4 пленарни доклада и 21 устни презентации. Събитието събра 159 участници, 18 от тях – българи (5-ма от ИИКТ-БАН). Трудовете от конференцията и семинарите, включително 5 статии, свързани с проект AComIn, са качени в цифровото хранилище на Асоциацията за компютърна лингвистика (ACL Anthology).

Предстоящи научни събития, подпомогнати от AComIn

Международен семинар „Autonomic Computing and Automatic Control in Computer Systems" (ACACCS) е съпътстващо събитие на Международна конференция „Автоматика и информатика 2013", която ще се проведе на 3-7 октомври 2013 в София. Семинарът има за цел да демонстрира потенциала на резултатите от проект AComIn за развитието на автономните изчисления и автоматизираното управление в компютърните системи. Избрани статии ще бъдат публикувани в специално издание на научното списание "Cybernetics and Information Technology", издавано от ИИКТ-БАН.

Семинар „ИКТ за нови материали и нанотехнологии" е съпътстващо събитие на Международната конференция „Роботика, автоматика и мехатроника" (RAM 2103), която ще се проведе на 8-10 октомври 2013 г. в Банкя. Програмата на семинара съдържа 11 поканени лекции и 21 презентации на учени от ИИКТ-БАН. Избрани статии ще бъдат публикувани в специално издание на научното списание "Cybernetics and Information Technology", издавано от ИИКТ-БАН.

Първи AComIn семинар за трансфер на технологии:
Приложения на компютърното зрение за медицинска диагностика

Лектор: **проф. Петя Радева – Университет на Барселона, Испания**

Д-р Петя Радева е водещ изследовател в Университета на Барселона. Тя е ръководител на Лабораторията по перцептуални изчисления в Барселона и директор на MiLab of Computer Vision Center (www.cvc.uab.es). Настоящите й научни интереси са насочени към развитие на подходи, основани на самообучение (в частност – статистически методи), към компютърното зрение и обработката на изображения. Тя е ръководител на 15 проекта (европейски, международни и национални), както и на 19 проекта за трансфер на технологии с испански, американски и израелски компании. Д-р Радева притежава 15 патента в областта на компютърното зрение, обработката на изображения и медицински образи. Някои от проектите, ръководени от д-р Радева са: Machine learning tools for large scale object recognition, Audience measurements by Computer Vision, Evaluation of Intestinal Motility by Endoluminal Image Analysis, Sponsored Research Agreement on Automatic Stent Detection in IVUS, Study for the development of a polyp detection algorithm under a Polyp Detection, и др.

Програма на семинара:

(проведен на английски език)

24 юли: 14.00 – 18.00

Introduction: Computer Vision in Barcelona University;

Segmentation techniques:

- Snakes and level sets;
- Graph-cuts.

25 юли: 10.00 – 13.00

Image context analysis:

- Shape context;
- Active shape models and Active appearance models;
- Bayesian context modeling.

25 юли: 14.00 – 18.00

Applications to medical diagnosis and treatment – two real clinical projects:

- Introduction to Medical imaging;
- Arteriosclerotic plaque analysis in intravascular ultrasound images of coronary vessels;
- Stent detection.

26 юли: 10.00 – 13.00

Neuroimaging;

Intestinal motility analysis in wireless endoscopic images

Семинарът беше проведен на 24-26 юли 2013 г. като 14-часов курс и събра 33 участника от четири фирми (MMSolutions АД, 3PS-SIMULIA, AVIQ Bulgaria Ltd. и Vitronic GmbH), два университета (ТУ-София и ТУ-Велико Търново), 17 участника от ИИКТ-БАН, както и представители на 6 други института към БАН. Лекциите са достъпни на сайта на проект AComIn (**http://iict.bas.bg/acomin/bg/news.html**).

AComIn
Advanced Computing for Innovation
FP7-REGPOT-2012-2013
Grant Agreement: 315087
http://iict.bas.bg/acomin/index.html

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Втори AComIn семинар за трансфер на технологии:

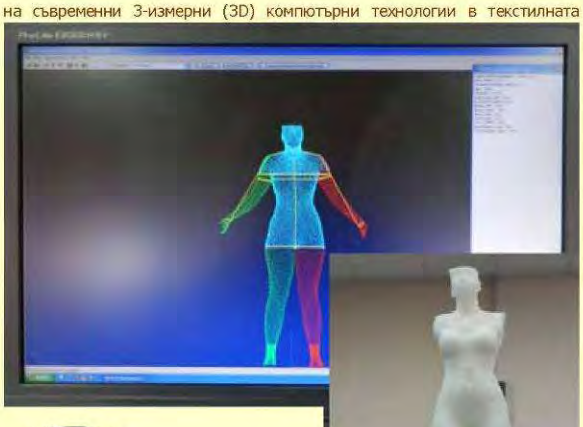
Приложения на съвременни 3D технологии в текстилната индустрия и модата

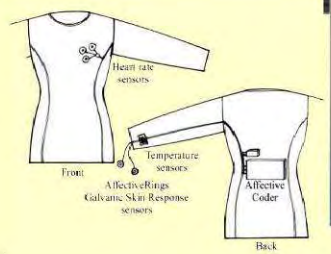
Лектор: **Д-р Петър Гулев – Колеж по мода, Университет по изкуствата, Лондон**

Д-р Гулев е информатик, завършил Техническия университет в София. Той има докторска степен от Имперския колеж в Лондон, Великобритания и натрупва опит като научен работник в Лондонския моден колеж (London School of Fashion) към Университета по изкуствата – Лондон. Семинарът се проведе в ИИКТ-БАН в периода 2 – 5 септември 2013 г. Събитието беше организирано със съдействието на:

- **Британския съвет**, който подкрепя популяризиране на науката и лекции на специалисти, получили научни степени в Великобритания, и
- **Министерството на образованието и науката на Република България**, което осигури оборудване и компетентна техническа подкрепа за провеждането на високо-технологичния курс.

Д-р Петър Гулев запозна участниците с научните и технически достижения в курс на тема: „Приложение на съвременни 3-измерни (3D) компютърни технологии в текстилната индустрия и модата". Бяха разгледани подходи за изследване на мнението на потребителите, сканиране и създаване на 3D модели на човешкото тяло, 3D проектиране на дрехи и аксесоари, както и използване на 3D модели при електронната търговия в модната индустрия. Д-р Гулев представи също така и иновативна концепция за облекло на бъдещето, разработена заедно с Лиза Стед: дрехи, които променят външния си вид според настроението и чувствата на облечения, например излъчват различни цветови сигнали (т. нар. emotional fashion). Сред 22-мата участници в курса бяха собственици и управители на фирми от текстилната индустрия, дизайнери на облекла, университетски преподаватели и учители в специализирани средни училища.





По покана на лектора в семинара се включиха и водещи български фирми в областта на 3D технологиите: Print3D.bg (**http://www.3dprint-bg.com**), които демонстрираха създаване на 3D обекти в реално време чрез MakerBotReplicator2 и екологично чисти царевични заготовки, и Т.Е.А.М ООД (**http://www.team.bg**), които осигуриха софтуер за ръчен 3D скенер ZScanner 800 за сканиране на 3D текстилни обекти и човешки форми в реално време.

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Electronic version of this newsletter can be found in http://iict.bas.bg/acomin/bg/docs/e-newsletters/E-Newsletter-no2.pdf.

7.3. ACOMIN NEWSLETTER №3

AComIn Newsletter №3

Advanced Computing for Innovation — *March 2014*

AComIn Mission: to strengthen the research and innovation capacity of the Institute of Information and Communication Technologies – Bulgarian Academy of Sciences (IICT-BAS) by increasing the knowledge and skills of its researchers in emerging areas as well as by purchasing modern research infrastructure. AComIn should help the institute to successfully accomplish its strategic mission: by 2016, i.e. 5 years after its creation, IICT-BAS has to become a leading RTD Centre in Eastern Europe, providing facilities and working conditions comparable to the average standards of the EU Centres of Excellence in ICT. The institute will support the sustainable regional and national growth and employment by providing RTD results to advanced industrial organisations; it will be a focal point of high-quality research and training in advanced ICT topics.

Progress Report (September 2013 – March 2014)

Project Appreciation

On 10th February 2014 ***the President of the Republic of Bulgaria Rossen Plevneliev*** visited the Institute of Information and Communication Technologies. During his visit the President was made familiar with the current AComIn results and met postdoctoral researchers incl. Dr. Jan Michel Sellier, Dr. Clemens Hofreither, Dr Ivan Georgiev and Dr. Stanislav Stoykov. The President was accompanied by Mrs. Anna-

Marie Vilamovska - the Secretary for Health care, Education and Science and Dr. Martin Ivanov – the Secretary for Culture, Education and National Identity. The Bulgarian Academy of Sciences was represented by acad. Stefan Vodenicharov – the BAS President, Acad. Damyan Damyanov and Cor. Member Nikolay Miloshev – BAS Vice-Presidents, and Prof. Evdokia Pasheva – the Scientific Secretary General of BAS. The visit of President Plevneliev to IICT-BAS was covered by the Bulgarian National TV Chanel 1.

On February 17 IICT-BAS was visited by ***Mr. Wolfgang Burtscher, Deputy Director General of DG Research and Innovation, European Commission.*** Prof. Svetozar Margenov, the Director of IICT-BAS, presented the activities of the Institute emphasizing on the participation of IICT-BAS in EU-funded projects Prof.

Galia Angelova, - AComIn Coordinator, briefly introduced the project. Mr. Burtscher was accompanied by Mr. Ivan Krastev, the Vice-Minister of Education and Science, Mrs. Marieta Deliverska, the Head of Science Directorate in the Ministry of Education and Science, and Prof. Evgenia Stoimenova, a Scientific Secretary of BAS. Mr Burtscher and the accompanying persons were familiarized with the capabilities of the high-tech equipment, which makes up Smart Lab, deployed in IICT-BAS in the frame of AComIn project.

On 18 February 2014 during the Horizon 2020 Launch Conference held in Sofia, ***Prof. Anelia Klisarova, Minister of Education and Science of Republic Bulgaria***, awarded project AComIn with a ***Honorary Diploma*** for developing the regional capacity of the Bulgarian academy organization – IICT-BAS. The Diploma was bestowed on ***Prof. Galia Angelova***, AComIn coordinator, in the presence of Mr. Wolfgang Burtscher, Deputy Director General DG Research and Innovation, European Commission.

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WP1: Strengthening the IICT-BAS Human Potential

Employed Incoming Post-docs

Dr. Vladimir Kotev was appointed to a post-doc position in IICT-BAS in December 2013. He came to the institute from Gifu University – Japan, where he was working on design, dynamical modeling and simulations, control and development of a drilling and cutting robotized hand-held system for the orthopedic surgery. While working in IICT-BAS he will conduct research on design, dynamics and control of robots and mechatronics systems for biomedical applications as well as on biomechnics. In this research he is going to use some parts of the SmartLab equipment such as the thermo and high speed cameras, computer tomography and 3D Printer.

WP2: Purchasing Smart Lab Equipment and Building User Communities

In AComIn Newsletter 2 we have presented 3 of 9 SmartLab devices purchased by IICT-BAS after a public tender that was completed in August 2013. Now the next 5 devices are briefly described.

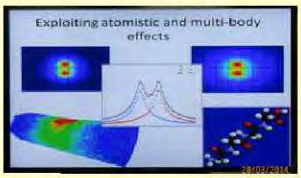
High Speed Camera NacMemrecam HX6 offers an astounding 5 MegaPixel resolution at up to 1,000 fps, Full HD resolution at up to 2,330 fps, 1 MegaPixel resolution at up to 4,600 fps, and much more. The HX-6 gives the user the best possible solutions: the highest resolutions available; the highest light sensitivity available; and ultra fast imaging.

Tomograph XTH 225 Compact industrial CT scanning is a real-time inspection system offering both fully programmable and manual operation. It is designed to deliver high quality results in a quick, straightforward process. The XT H 225 is ready for CT applications. With its powerful 225kV source, high resolutions and measurement volume of ø250mm and 600mm height, it is suited for a wide range of applications, including inspection of small plastic parts and castings and research of organic materials.

The video conference module Radvision Scopia consists of:

- Video conference display Radvision (Avaya) Scopia XT Meeting Center S55 – a high performance HD video conferencing solution powered by the Scopia XT5000. It integrates single 55" 1080p premium display in a specially designed cart for creating a high quality meeting environment.

- Video conferencing codec Radvision (Avaya) XT5000 endpoint.
- Device for multi-stream telepresence connectivity Radvision (Avaya) Scopia Elite 5105/20 with 1080p High Definition processing, multi-stream connectivity, 24 video layout options woth up to 28 participants displayed simultaneously through Continuous Presence.



- Video communication server Server Supermicro 825TQ-600LPB
- Display for 2D and 3D visualization Lirex Delux Screen Wall SCW1500M
- Digital Projection M-Vision 1080p 400 Cine 3D

Hand-held color 3D laser scanner Handyscan 3D VIUscanCreaform stands out as the most accurate portable 3D scanners on the market today. It has geometry resolution of 0.1 mm, accuracy of up to 50 µm, texture resolution of 50 to 250 DPI (userconfigurable), texture colors of 24 bits, sRGB-calibrated, depth of field of 30 cm and outputs in file formats: .ma, .dae, .obj, .x3dz, .x3d, .zpr, .wrl, .fbx, .ply, .stl, .txt.

The Brüel & Kjær system for sound analysis allows merging/fusing of information from the different modality sensors – microphone array and camera. Acoustic Holography and Beamforming techniques are used for localizing sound sources. Two patented innovations are embedded in the system – micro-phone technology and irregular (random) anten-na array. The system measures the acoustic noise in indoor and outdoor applications and visualizes them. The measurement objects can be very tiny as well as very huge.

Technology Transfer Seminars

The seminar on Industrial Mathematics was held in 19 December 2013 in IICT-BAS. The event was organized in collaboration with Fraunhofer

ITWM, Kaiserslautern, Germany (partner in the AComIn project). The cooperation with the Bulgarian Branch Chamber of Machine Building (www.castingarea.com/societies/bbcmb.htm) and the Cluster of Mechatronics and Automation (http://www.cluster-mechatronics.eu/) was highly appreciated. The aim of the event was to demonstrate the

potential of the available SmartLab equipment and to confirm our intention for cooperation and know-how transfer with industrial partners. The first part of the seminar was devoted to presenting the SmartLab equipment recently purchased in the framework of the AComIn project. After that the program continued with a plenary lecture given by Prof. Oleg Iliev from Fraunhofer ITWM, followed by a presentations of particular industrial applications developed in the IICT. The workshop was closed with a panel discussion about problems and perspectives in industrial mathematics. A key topic was related to practical questions/experience concerning real life collaboration between academic researchers and industrial companies. The seminar gathered 6 researchers from IICT-BAS and 26 participants outside IICT: 18 of them from industrial entities (mostly representing SMEs), 7 - from universities and academic institutes from Bulgaria and 1 – from Germany.

The 2nd seminar on Video segmentation: applications to medical imaging and life-logging data was held on 16 January 2014. The lecturer was *Prof. Petia Radeva* from the University of Barselona, Spain. The seminar gathered 13 researchers from Technical University of Sofia,

the University of Library Studies and Information Technologies and several research institutes from the Bulgarian Academy of Sciences.

A three day training course on Thermography – making and analysing thermogramms made by FLIR P640 Thermo camera was held on February 11-13, 2014. The course was devoted for training specialists from IICT-BAS. The lecturer was *Dr. Todor Bagarov* from STEDOR Ltd., who was a representative of FLIR Systems in Bulgarian Market. The course aimed at familiarizing listeners with basic knowledge of Infrared Thermography; How to operate the camera under different conditions and for various purposes; to teach them how to do an appropriate treatment of the measurement situation in the field or

laboratory conditions; how to identify and correct potential error sources / issues; how to be able to do IR inspections following written guidelines and to create database from the result of inspection and how to create final report using FLIR Reporter Pro software. The course was attended by 18

specialists from IICT-BAS and 1 specialist from VIDAKO Ltd. Company.

The seminar on 3D Scanning and Digitalization was held in IICT-BAS on 17 March 2014. The seminar was organized by IICT-BAS and two Bulgarian companies – ADA 3D (www.ada3d. com) and GeoCAD-93 (www.geocad93.com). Prof. Galia

Angelova, the Coordinator of AComIn project, briefly presented the project objectives and described the 3D equipment bought in the frame of AComIn. Mr. Jury Radkov, the Manager of ADA 3D, made a presentation titled "3D scanning – general review of the technology of 3D scanning and types of 3D

scanners; main application areas and example of best practices". The presentation of Mr. Milush Blagoev from GeoCAD-93 was on 3D laser scanning, digitalization and preservation of immovable objects of cultural heritage. The seminar was attended by 36 listeners from 16 organizations.

WP3: Networking with Leading EU Partners

Incoming short visits

From the 14th to 20th of January, 2014, IICT-BAS was visited by ***Prof. Petia Radeva*** from the University of Barselona (UAB), Spain. This was the 2nd visit of Prof. Radeva in the frames of the AComIn project. On January 16 she gave a lecture titled "Video segmentation: applications to medical imaging and life-logging data" presented to the AComIN User Group "Advances in Image and Video Analysis"

Prof. Dr. Vlastimir Nikolic from Nis University, Serbia visited the IICT-BAS in the period March 28-30, 2014. The visit was aimed at exchanging

and sharing experiences and research results, and visiting the Doors Open Days organized by the institute on March 28-29. During his visit, Prof. Nikolic had meetings and discussions with leading scientists from the "Embedded Systems" Department as well as with some post-docs employed by AComIn Project. As a result of his visit some topics for joint research in the area of robot control and control of technological processes (using the Laser Particle Nano Sizer and the EDEM Software) were specified.

Prof. Dr. Viktor Gavrilovski from Skopie University, Macedonia visited IICT-BAS in the period March 27-29, 2014. The visit was aimed at exchanging and sharing experiences and research results as well as visiting the Doors Open Days organized on March 28-29 by the institute. During his visit Prof. Gavrilovski had meetings and discussions with leading scientists from the "Embedded Systems" Department. Some directions for future joint research in the area of mechanics and mechatronics (using the Thermo Camera and the High Speed Camera) were specified.

Prof. Felix Yanovsky visited IICT-BAS in the period March 26 – 31, 2014. He is an IEEE Fellow and Head of the Electronics Department at the National Aviation University in Kiev, Ukraine. The main aim of his visit was to exchange and share experience and research results as well as to discuss the practical challenges and solutions identified in accomplishing the main objectives of the AComIn project. During his visit Prof. Yanovsky took part in a series of lectures held within the AComIn Doors Open Days. On 27.03.2014 he presented a lecture titled *"Researches in the field of Radar and related areas in the Electronics Department at the National Aviation University of Ukraine"*, which caused fruitful discussions and raised interest in further deepening the research contacts between both institutes.

The visit of ***Assoc. Prof. Rustem Sinitsyn*** from The National Aviation University in Kiev, Ukraine (March 26 – 31, 2014) was aimed at introducing himself to the AComIn Management Board in order to apply for a post-doc position in IICT-BAS. On 27.03.2014 he read a lecture titled *"Non-Parametric algorithms of signal processing for active and passive MIMO noise acoustic radars"*.

Prof. Dr. Sofia Panteliou from Patras University, Greece visited the IICT-BAS in the period March 26-30, 2014. The visit was aimed at exchanging and sharing experiences and research results as well as participating in the Doors Open Days organized by the institute on March 28-29 as well as meeting the IICT researchers and discussing a potential joint collaboration in the context of the AComIn project. On 27.04.2014 Prof. Panteliou gave a lecture entitled "Design, Biodesign, Applications" addressing main elements of biological simulation models and applications in biological modelling and biological models of human bones. During her visit Prof. Panteliou had meetings and discussions with leading scientists from the "Modeling and Optimization" and "Embedded Systems" Departments of IICT-BAS. Some topics for joint research in the area of modelling biological objects (with using of the 3D Tomograph and the 3D Scanner) were specified.

Prof. Biljana Krsteska from the Faculty of Natural Sciences and Mathematics at the St. Cyril and Methodius University in Skopje, Former Yugoslav Republic of Macedonia and ***Assoc. Prof. Gökhan Çuvalcioğlu*** from the Department of Mathematics at the Mersin University in Turkey visited IICT-BAS for the period 26 – 30 March 2014. During his visit he took part in the AComIn Doors Open Days and actively participated in the discussions concerning future applications of the SmarLab equipment and further deepening the research contacts between the institutes.

Prof. Konstantin Lukin and ***Dr. Vladimir Kudriashov*** visited IICT-BAS in the period March 24 – 30, 2014. Prof. Lukin is IEEE Fellow and the Head of the Laboratory for Nonlinear Dynamics of Electronic Systems at the Institute for Radiophysics and Electronics at Ukrainian National Academy of Sciences in Kharkov. During his visit Prof. Konstantin Lukin took part in a series of lectures held within the "AComIn Door Opend Days". On 26.03.2014 he gave two lectures – "History and Current Research of the Noise Radar (Fifty Years of Noise Radar)" and "Coherent imaging using Random Signals and Antenna with Aperture Synthesis in active and Radiometric modes", which caused fruitful discussions and raise interest in further deepening the research contacts between the two institutes. On 26.03.2014 Dr. Kudriashov gave a lecture titled "Radiometric Synthetic Aperture Radar". The visit of Dr. Kudriashov was also related to his intention to introduce himself to the AComIn Management Board in order to apply for the post-doc position in IICT-BAS.

Prof. Veno Pacovski, Vice-Dean of the School of Computer Science and Information Technology in the University American College – Skopje, Macedonia, attended the AComIn Open Doors Days on March 28th and March 29th. Visiting IICT, he discussed the requirements to candidates for post-docs employment in AComIn in order to inform prospective post-doctoral researchers from Skopje about the open positions. Prof. Pacovski will inform also colleagues from the Faculty of Civil engineering, University of Skopje "St.St. Cyrill and Methodius", of the potential of the SmartLab equipment

Prof. Costin Badica, Dr. Marian Cristian Mihaescu, and Dr. Mihaela-Tinca Udristioiu from the University of Craiova, Romania, attended the AComIn Information Day on March 28th (arrival March 27th, departure March 29th). The main objective of their visit was to enable exchange of information about the AComIn project (from IICT side) and potential candidates for post-doctoral position (from Craiova side).

WP5: Dissemination

In the period of March 28-29, 2014 IICT-BAS organized ***Doors Open Days*** in which the SmartLab equipment and its applications were demonstrated. At the Opening ceremony Prof. Galia Angelova, the Coordinator of AComIn project, explained the main objectives of the project and briefly introduced the project tasks and the results already achieved. Then the visitors had a possibility to see the SmartLab equipment in work and to discuss with AComIn members its possible applications. The *Acoustic Holography equipment* was demonstrated in Hall 2 of block 25A. The application of beam-forming techniques for noise source identification was shown. Thermo and high speed cameras potentialities were demonstrated in Hall 218 of Block 25A. The demonstrations of the Laser Particle sizer, Hand-held color 3D laser scanner and the DEM software were organized in Hall 110 of Block 2. Operating with the Computer Tomograph XTH 225 C was demonstrated in Hall 010 of Block 2. The potentialities of the 3D Visual wall were demonstrated in Hall 2 of Block 25A. The Doors Open Days were attended by more than 120 visitors from 30 organizations. The event was also covered by the National Bulgarian TV Channel 1.

Scientific Events Supported by AComIn

The International Workshop "Autonomic Computing and Automatic Control in Computer Systems" (ACACCS) was held on 3-4 October 2013 in Sofia as a co-event of the International Conference "Automatics and Informatics" 2013. The workshop was devoted to presentations of the research results achieved by the scientific efforts connected with AComIn project and gathered scientists from Bulgarian Academy of Sciences, the Technical University, Sofia, the University of Artois, France, Scientific Institute of Transport Technologies, Paris, France, University of Technologies, Belfort, France, who participate actively in the research and development of modern transportation systems. Most of the particular topics considered in the workshop, concerned modelling, control and optimization of transportation systems. The event contained 3 invited talks and 16 oral presentations. After the workshop six papers were approved and published in Volume 13, No 4, 2013 of "Cybernetics and Information Technologies" journal.

Workshop "ICT for New Materials and Nanotechnologies" was held on October 8-10 in Bankya as a co-event of the International Conference "Robotics, Automation and Mechatronics" RAM 2013. The Workshop covered such major research topics related to the AComIn project as mobile systems, micro and nano robotics, robot mechanisms and design, robot perception and control, application of robotics and mechatronics, new materials, mano technologies etc 3 invited talks, 11 talks of Bulgarian IICT partners and 21 oral presentations of IICT staff members were presented at the workshop. The selected papers will be published in a special issue of "Cybernetics and Information Technologies" journal.

Upcoming Events Supported by AComIn

International Workshop "Advanced Control and Optimization: Step Ahead" (ACOSA'14) will be held on May 8-10, 2014 in Bankya Palace Hotel, Bankya, Bulgaria. The aim of the workshop is to gather specialists interested in the fields of control and optimization, decision making techniques, process control systems, intelligent agents and systems, and other related topics, and to give them floor to present their latest achievements and to engage in fruitful discussions of theoretical and practical aspects.

The International Workshop on Biometrics (BIOMET 2014) will be held on 23-25 June 2014 in Sofia, Bulgaria. Biometrics (or biometric authentication) refers to the identification of humans by their characteristics or traits. Biometrics is used in computer science as a form of identification and access control and in order to identify individuals in groups that are under surveillance. BIOMET 2014 integrates and continues the tradition of the international conferences CompSysTech, one of the longest running international conferences that started in Bulgaria, in 2000. At the same time BIOMET 2014 is primarily connected

with the aims of IICT-BAS's project AComIn to disseminate the recent advance in Biometrics among the research groups and companies in Bulgaria and Balkan countries as well. The selected workshop papers will be published in a special volume of Springer Lecture Notes in Computer Science.

The 16th International Conference on Artificial Intelligence: Methodology, Systems, Applications (AIMSA 2014) will be held on 11-13 September in Golden Sands Resort, Varna, Bulgaria. The AIMSA conference series has provided a biennial forum for the presentation of AI research and development since 1984. The conference, which is held in Bulgaria, covers the full range of topics in Artificial Intelligence and related disciplines and provides an ideal forum for international scientific exchange between Central/Eastern Europe and the rest of the world. AIMSA 2014 is sponsored by ECCAI, the European Coordinating Committee for Artificial Intelligence. The conference proceedings will be published as a special volume of Springer Lecture Notes in Computer Science. ***The Workshop on ICT Technologies for the Multimodal Capture, Semantic Analysis and 3D Representation of Cultural Heritage*** will be held on 10 September 2014 as an associated event of AIMSA 2014. This a full-day workshop will address the challenges posed for the semantic analysis and representation cultural heritage by the availability of novel ICT technologies for the multimodal capture and semantic analysis of cultural heritage (including tangible and intangible) as well as 3D technologies for the representation and visualization. The workshop will focus on interdisciplinary research on tangible and intangible on Cultural Heritage, including new technologies for the capturing, digitization, analysis, safeguarding and preservation of Cultural Heritage. These technologies will offer new ways to store, use and experience the content and metadata generated, such as novel applications for research, education and tourism. The workshop is meant to be a forum for interaction of ICT and 3D specialists and experts in Cultural Heritage, featuring presentations on the topic by leading experts and concluded by a panel discussion that should lead to a roadmap of future activities for this challenging area of research.

The 8th International Conference on Numerical Methods and Applications NM&A'14 will be held 20-24 August 2014 in Borovets, Bulgaria. The conference covers the full range of research in the area of numerical methods and their applications including Numerical methods for differential and integral equations; Approximation techniques in numerical analysis; Numerical linear algebra; Multi-scale and reduced order numerical methods; Hierarchical and domain decomposition methods; Parallel algorithms; Monte Carlo methods; Computational mechanics; Computational physics, chemistry and biology; Engineering applications; Advanced computing for innovation , etc. The list of special sessions include: Monte Carlo and Quasi-Monte Carlo Methods; Metaheuristics for Optimization Problems; Advanced Numerical Methods for Scientific Computing; Advanced Numerical Techniques for PDEs and Applications; Solving Large Engineering and Scientific Problems with Advanced Mathematical Models and Numerical Simulations and Back Analysis in Civil and Mechanical Engineering. The refereed and presented papers will be published as a special volume of Springer Lecture Notes in Computer Science (LNCS).

WP7: Management

The 2nd AComIn Steering Committee Meeting after year 1 took place in Starosel, Bulgaria within the framework of an Information Day discussing the project achievements in year 1. The Information Day contained 13 presentations about various AComIn activities. Three presentations summarized the results of the incoming post-docs, recruited in the project in year 1 (Dr Jean Michel Sellier, Dr Stanislav Stoykov and Dr Irina Temnikova). The Progress report for year 1 was presented too, including a discussion of the project progress towards the objectives, explanation of deviations and the related contingency plan, as well as financial analysis. After the Information Day presentations, the Steering Committee members met at a special session to discuss findings, make suggestions and plan further tasks in year 2. After this session they have concluded that IICT had succeeded in attracting several excellent post-docs who had the potential to become future team leaders. The young people get the feeling that they are part of the team. So the partners considered the first year an excellent start for the project. The Steering Committee members also noted that AComIn had been a catalyst of a very important process for Bulgaria – Technology Transfer to

industry. The project forces the institute to adopt good practices in innovation and to develop related normative documents. This is an extremely positive project effect and this is the right type of project for Bulgaria as it builds upon the existing good background in the Institute, strengthens it and prompts IICT to develop Innovation Policies. The next Steering Committee meeting is scheduled in October 2014.

This Project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 316087

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IICT
Institute of Information and Communication Technologies

Electronic version of this Newsletter can be found in http://iict.bas.bg/acomin/docs/e-newsletters/E-Newsletter-no3.pdf.

8. OTHER DISSEMINATION ACTIVITIES

8.1. PUBLISHING BOOKS AND MONOGRAPHS

During the reporting period the AComIn Scientific Council has approved for publishing a monograph authored by the Assistant Professor Svetoslav Savov titled “Solution Bounds for Algebraic Equations”. The book is intended for a wide readership including engineers, applied mathematicians, graduate students seeking a comprehensive view of the main results on the estimation of the solutions of four algebraic equations, namely, the continuous-time and the discrete-time Lyapunov and Riccati equations. The book is organised as follows. A detailed summary of various solution bounds for the considered algebraic equations, which have been proposed since the 1970s, is presented in Chapter I. Different approaches are discussed in order to demonstrate the efficiency and the shortcomings of a particular method. As a consequence of this analysis and motivated by the conservatism in solution estimation, the author suggests a new approach to extend the sets of coefficient matrices for which various bounds are valid under less restrictive conditions. The main contributions can be briefly formulated as follows:

- It has been proved that extensions can be achieved by taking into account the singular value decomposition of the coefficient matrix for both the continuous-time (Chapter 2) and the discrete-time (Chapter 3) equations.
- Much attention is paid to the improvement of solution bounds. It is shown how available bounds can be used to derive new tighter estimates.

The bounds proposed in this book are illustrated by eleven numerical examples, including four real data cases in Chapter 4. The results are analyzed with respect to tightness and validity measured by several error indicators.

The book provides quick and easy references for the solution of different engineering and mathematical problems. Because both the mathematical development and the applications are considered, it can be useful for solving problems and for research purposes, as well.

Currently the monograph is under print in the Printing House “Marin Drinov” of Bulgarian Academy of Sciences. The total print of the book will be given away to the Central Library of Bulgarian Academy of Sciences for free of charge, interlibrary exchange with other academic and university libraries in Europe and USA.

8.2. PUBLISHING PROMOTIONAL MATERIALS

In the beginning of the reported period an AComIn flyer (in Bulgarian and English) was designed.

Dissemination among the Academy, Business and the Society at Large

The AComIn results will be disseminated at scientific conferences and workshops, to industrial partners via technology transfer workshops, and at various information events for popularising the project. Two large International Conferences (LSSC 2013 and RANLP 2013) as well as three International Workshops have been organised in 2013 (see http://www.iict.bas.bg/acomin/events.html). Future dissemination activities include:

- **The International Conference AComIn-2015**: Advanced Computing for Innovation, July 2015,
- **Four International Conferences** belonging to established series: NM&A 2014, AIMSA 2014, LSSC-2015 and RANLP-2015,
- **Six Research Workshops**, dedicated to specific AComIn topics,
- **Know-How Transfer Workshops to User Communities**, focusing on technologies related to the SmartLab devices,
- **Doors Open Days**, each accompanied by a **Stock Exchange of Technology Transfer**, oriented towards User Communities and innovation-absorbing Bulgarian companies,
- **Information Days** (Awareness Days),
- Publishing **books, monographs**, and promotional project materials,
- Making **movies** for dissemination of AComIn results to the large audience,
- **A tour in Bulgaria** in 2015, aiming to advertise the AComIn project and disseminate its results in universities and high schools,
- Issuing periodical **Electronic Newsletters** and maintenance of a project website,
- Dissemination via **virtual dissemination channels**.

Administrative Information and Project Contact Details

Host organisation:
Institute of Information and Communication Technologies (IICT),
Bulgarian Academy of Sciences (BAS)

Grant agreement:
316087, call FP7-REGPOT-2012-2013-1
Research potential of convergence regions

Funding organisation:
European Commission
Directorate General for Research and Innovation

Starting date:
1 October 2012 г.

Duration:
42 months

Coordinator:
Prof. Galia Angelova, Dr Sc

Total project cost:
3 594 288 euro

Requested EU contribution:
3 219 478 euro

Project type:
Coordination and support action

Website, e-mail:
http://iict.bas.bg/acomin, acomin@bas.bg

Published: January 2014

Funded by the Seventh Framework Programme of the European Union

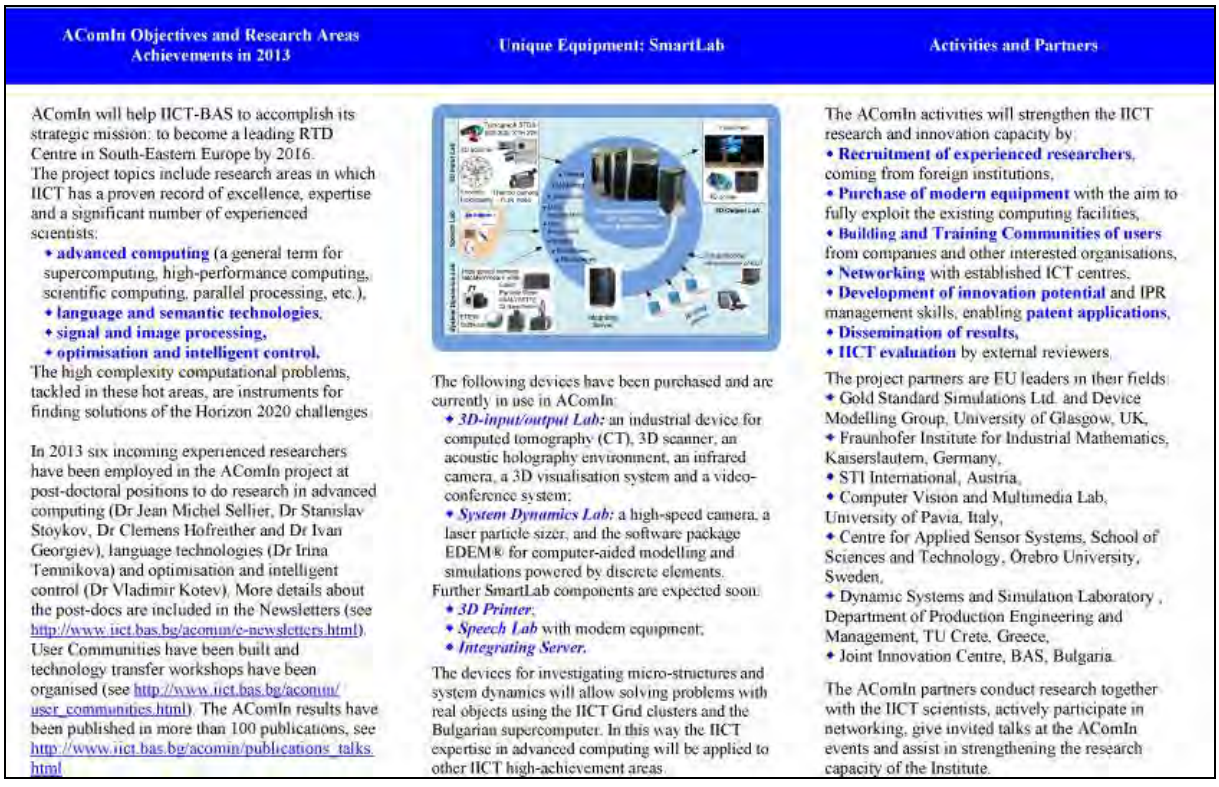
AComIn

ADVANCED COMPUTING for INNOVATION

AComIn

БЪЛГАРСКА АКАДЕМИЯ НА НАУКИТЕ

IICT



AComIn Objectives and Research Areas Achievements in 2013

AComIn will help IICT-BAS to accomplish its strategic mission: to become a leading RTD Centre in South-Eastern Europe by 2016.
The project topics include research areas in which IICT has a proven record of excellence, expertise and a significant number of experienced scientists:

- **advanced computing** (a general term for supercomputing, high-performance computing, scientific computing, parallel processing, etc.),
- **language and semantic technologies,**
- **signal and image processing,**
- **optimisation and intelligent control.**

The high complexity computational problems, tackled in these hot areas, are instruments for finding solutions of the Horizon 2020 challenges.

In 2013 six incoming experienced researchers have been employed in the AComIn project at post-doctoral positions to do research in advanced computing (Dr Jean Michel Sellier, Dr Stanislav Stoykov, Dr Clemens Hofreither and Dr Ivan Georgiev), language technologies (Dr Irina Temnikova) and optimisation and intelligent control (Dr Vladimir Kotev). More details about the post-docs are included in the Newsletters (see http://www.iict.bas.bg/acomin/e-newsletters.html).
User Communities have been built and technology transfer workshops have been organised (see http://www.iict.bas.bg/acomin/user_communities.html). The AComIn results have been published in more than 100 publications, see http://www.iict.bas.bg/acomin/publications_talks.html

Unique Equipment: SmartLab

The following devices have been purchased and are currently in use in AComIn:

- ***3D-input/output Lab:*** an industrial device for computed tomography (CT), 3D scanner, an acoustic holography environment, an infrared camera, a 3D visualisation system and a video-conference system;
- ***System Dynamics Lab:*** a high-speed camera, a laser particle sizer, and the software package EDEM® for computer-aided modelling and simulations powered by discrete elements.

Further SmartLab components are expected soon:

- ***3D Printer;***
- ***Speech Lab*** with modern equipment;
- ***Integrating Server.***

The devices for investigating micro-structures and system dynamics will allow solving problems with real objects using the IICT Grid clusters and the Bulgarian supercomputer. In this way the IICT expertise in advanced computing will be applied to other IICT high-achievement areas.

Activities and Partners

The AComIn activities will strengthen the IICT research and innovation capacity by:

- **Recruitment of experienced researchers**, coming from foreign institutions,
- **Purchase of modern equipment** with the aim to fully exploit the existing computing facilities,
- **Building and Training Communities of users** from companies and other interested organisations,
- **Networking** with established ICT centres,
- **Development of innovation potential** and IPR management skills, enabling **patent applications**,
- **Dissemination of results,**
- **IICT evaluation** by external reviewers.

The project partners are EU leaders in their fields:

- Gold Standard Simulations Ltd. and Device Modelling Group, University of Glasgow, UK,
- Fraunhofer Institute for Industrial Mathematics, Kaiserslautern, Germany,
- STI International, Austria,
- Computer Vision and Multimedia Lab, University of Pavia, Italy,
- Centre for Applied Sensor Systems, School of Sciences and Technology, Örebro University, Sweden,
- Dynamic Systems and Simulation Laboratory, Department of Production Engineering and Management, TU Crete, Greece,
- Joint Innovation Centre, BAS, Bulgaria.

The AComIn partners conduct research together with the IICT scientists, actively participate in networking, give invited talks at the AComIn events and assist in strengthening the research capacity of the Institute.

Разпространение на резултатите в академичните организации, сред бизнеса и обществото като цяло

Резултатите на AComIn ще бъдат разпространявани на научни конференции и семинари, чрез семинари за трансфер на технологии към индустриални потребители и различни информационни събития за популяризиране на проекта. През 2013 бяха проведени Международните конференции LSSC-2013 и RANLP-2013 и три научни семинара (вж. http://www.iict.bas.bg/acomin/events.html). Предстои провеждането на:

- **Международна конференция AComIn-2015**: Advanced Computing for Innovation – посветена на проекта,
- **Четири международни научни конференции** от утвърдени серии: NM&A 2014, AIMSA 2014, LSSC-2015 и RANLP-2015,
- **Шест научни семинара**, посветени на отделни теми на проекта AcomIn,
- **Семинари за трансфер на ноу-хау** към потребителски групи с фокус върху технологии, свързани с устройствата от Smart Lab,
- **„Дни на отворени врати"**, съпътствани от **„Борса за технологичен трансфер"**, ориентирани към потребителски групи и иновативни български фирми,
- Ежегодни **„Информационни дни"**,
- **Публикуване на книги и монографии**, рекламни и промоционални материали за проекта,
- Създаване на **научно-популярни филми**,
- **Турне из страната** през 2015 г. с цел популяризиране на проекта AComIn и неговите резултати в университети и гимназиални школи,
- Издаване на **периодични Електронни бюлетини**, достъпни на сайта на проекта.

Административни данни за проекта и контакти

Базова организация:
Институт по информационни и комуникационни технологии (ИИКТ),
Българска Академия на Науките (БАН)

Договор:
316087, конкурс FP7-REGPOT-2012-2013-1
Research potential of convergence regions

Финансираща организация:
Европейска комисия
Главна дирекция "Научни изследвания и иновации"

Дата на стартиране:
1 октомври 2012 г.

Продължителност:
42 месеца

Координатор:
проф. дмн Галя Ангелова

Обща стойност на проекта:
3 594 288 евро

Размер на максималното планирано финансиране от Европейската комисия:
3 219 478 евро

Тип на проекта:
Поддържаща дейност (Support Action)

Страници в Интернет, електронна поща:
http://iict.bas.bg/acomin, acomin@bas.bg

Публикувано: януари 2014 г.

Финансиран по Седма рамкова програма на Европейския съюз

СЪВРЕМЕННИТЕ ПРЕСМЯТАНИЯ В ПОЛЗА НА ИНОВАЦИЯТА

AComIn

ADVANCED COMPUTING for INNOVATION

AComIn

БЪЛГАРСКА АКАДЕМИЯ НА НАУКИТЕ

ИИКТ

Цели и тематика на AComIn. Постижения през 2013 г.

Стратегическата мисия на проекта е да подпомогне превръщането на ИИКТ-БАН във водещ център за научни изследвания и приложни разработки в областта на Информационните и Комуникационни Технологии (ИКТ) в Югоизточна Европа. Тематиката на AComIn обхваща научни области, в които ИИКТ има водещи резултати, доказана експертиза и значителен ресурс от опитни сътрудници:

- **съвременни пресмятания** (обобщено наименование за високопроизводителни изчисления, суперкомпютинг, научни пресмятания, паралелни алгоритми и т.н.),
- **езикови и семантични технологии,**
- **обработка на сигнали и изображения,**
- **оптимизации и интелигентен контрол.**

В тези актуални области се решават изчислителни задачи с висока сложност, които са инструменти за атакуване на предизвикателствата в програмата Хоризонт 2020.

През 2013 г. в ИИКТ бяха привлечени пост-докторанти, които извършват научни изследвания в областта на съвременните пресмятания (д-р Жан Мишел Селие, д-р Станислав Стойков, д-р Иван Георгиев, д-р Клеменс Хофрайтер), езиковите технологии (д-р Ирина Темникова) и оптимизацията и интелигентния контрол (д-р Владимир Котев). Кратки интервюта с пост-докторантите са включени в бюлетините по проекта (вж. http://www.iict.bas.bg/acomin/e-newsletters.html). Започна сформиране на потребителски групи (http://www.iict.bas.bg/acomin/user_communities.html) и провеждане на лекции по защита на интелектуални права. Научните резултати по проекта са публикувани в повече от 100 публикации, изброени на http://www.iict.bas.bg/acomin/publications_talks.html

Уникална апаратура: умната лаборатория Smart Lab

По проекта са закупени и въведени в експлоатация следните устройства:

- ***3D-лаборатория:*** индустриален компютърен томограф, 3D скенер, среда за акустична холография, инфрачервена камера, 3D визуализационна система и видеоконферентна система;
- ***Лаборатория за динамика на системи:*** бърза камера, лазерен измервател на частици, софтуерен пакет EDEM® за моделиране и симулации на базата на дискретни елементи.

Предстои закупуване на 3D принтер, както и на:

- ***Лаборатория за обработка на реч*** със съвременно оборудване;
- ***Интегриращ сървър.***

Уредите за изучаване на микроструктури и динамика на системи ще позволят решаване на задачи за реални обекти с използване на Грид-клъстера в ИИКТ и българския суперкомпютър Blue Gene/P. Чрез AComIn става възможно наличната в ИИКТ експертиза по съвременни пресмятания да се приложи към други области, в които ИИКТ има традиционно добри постижения.

Дейности и партньори

Дейностите в AComIn развиват научния и иновационен потенциал на ИИКТ:

- **Назначаване на опитни изследователи**, пристигащи от чуждестранни институции,
- **Закупуване на модерно оборудване** с цел надстройка на съществуващите изчислителни ресурси,
- **Организиране и обучение на потребители** от фирми и други заинтересовани организации,
- **Научен обмен** с утвърдени ИКТ центрове,
- **Обучение по защита на интелектуална собственост, подаване на патентни предложения,**
- **Разпространение на резултатите,**
- **Оценка на ИИКТ** от външни рецензенти.

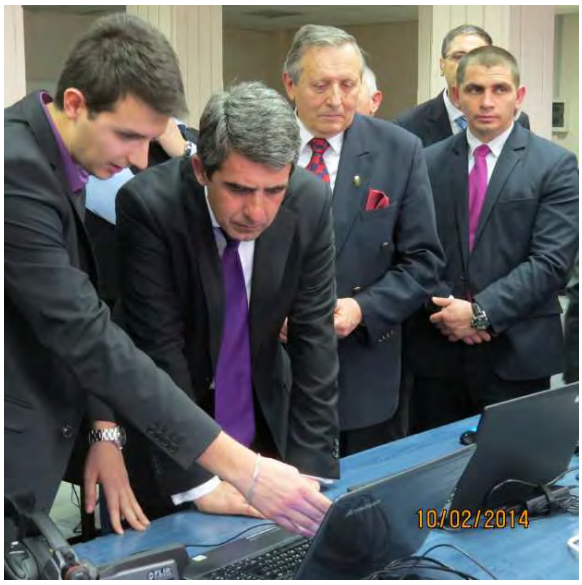
Партньорите в проекта са европейски лидери в своите области:

- Gold Standard Simulations Ltd. и Група по моделиране на устройства, Университет на Глазгоу, Великобритания,
- Фраунхофер институт по индустриална математика в Кайзерслаутерн, Германия,
- Международен институт по семантични технологии (STI International), Австрия,
- Лаборатория по компютърно зрение и мултимедия, Университет на Павия, Италия,
- Център за приложни автономни сензорни системи, Университет на Оребро, Швеция,
- Лаборатория за динамични системи и симулация, Технически университет на Крит в Ханя, Гърция,
- Единен иновационен център на БАН, България.

Партньорите в AComIn извършват научни изследвания по темите на проекта съвместно с учени от ИИКТ, активно участват в научен обмен, изнасят лекции на семинарите за трансфер на технологии и подпомагат изграждането на иновационен потенциал в института.

8.3. PROJECT APPRECIATION

The results and achievements of AComIn were demonstrated to the President of the Republic of Bulgaria - Rossen Plevneliev, who visited IICT-BAS on 10th February 2014. The President was accompanied by Mrs. Anna-Marie Vilamovska - the Secretary for Health care, Education and Science and Dr. Martin Ivanov – the Secretary for Culture, Education and National Identity. The Bulgarian Academy of Sciences was represented by Acad. Stefan Vodenicharov – BAS President, Acad. Damyan Damyanov and Cor. Member Nikolay Miloshev – BAS Vice-Presidents, and Prof. Evdokia Pasheva – Scientific Secretary General of BAS. During his visit the President also had a meeting with AComIn postdoctoral researchers Dr. Jan Michel Sellier, Dr. Clemens Hofreither, Dr Ivan Georgiev and Dr. Stanislav Stoykov. The visit of President Plevneliev to IICT-BAS was covered by the Bulgarian National TV Chanel 1.



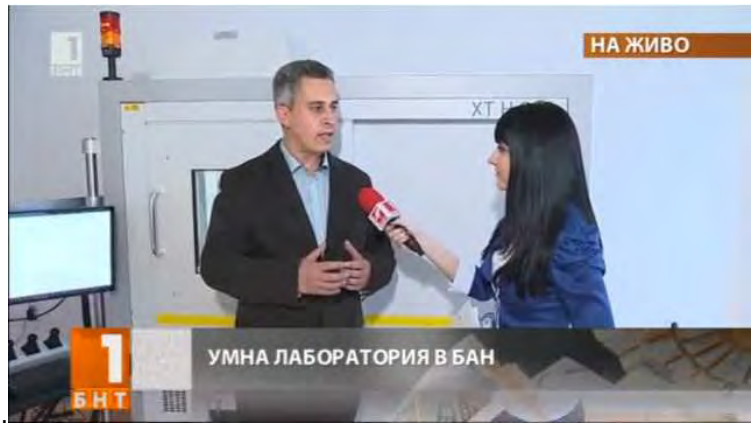
Some photos of this visit can be found in http://www.iict.bas.bg/docs/10-02-2014/gallery/index.html.

The project was also presented to Mr. Wolfgang Burtscher, Deputy Director General of DG Research and Innovation, European Commission, who visited IICT-BAS on 17th February 2014. Mr. Burtscher was accompanied by Mr. Ivan Krastev, Vice-Minister of Education and Science, Mrs. Marieta Deliverska, Head of Science Directorate in the Ministry of Education and Science, and Prof. Evgenia Stoimenova, Scientific Secretary of BAS. Mr Burtscher and the accompanying persons were familiarised with the capabilities of some of the high-tech equipment which constitute SmartLab made available in IICT-BAS in the frame of project AComIn.

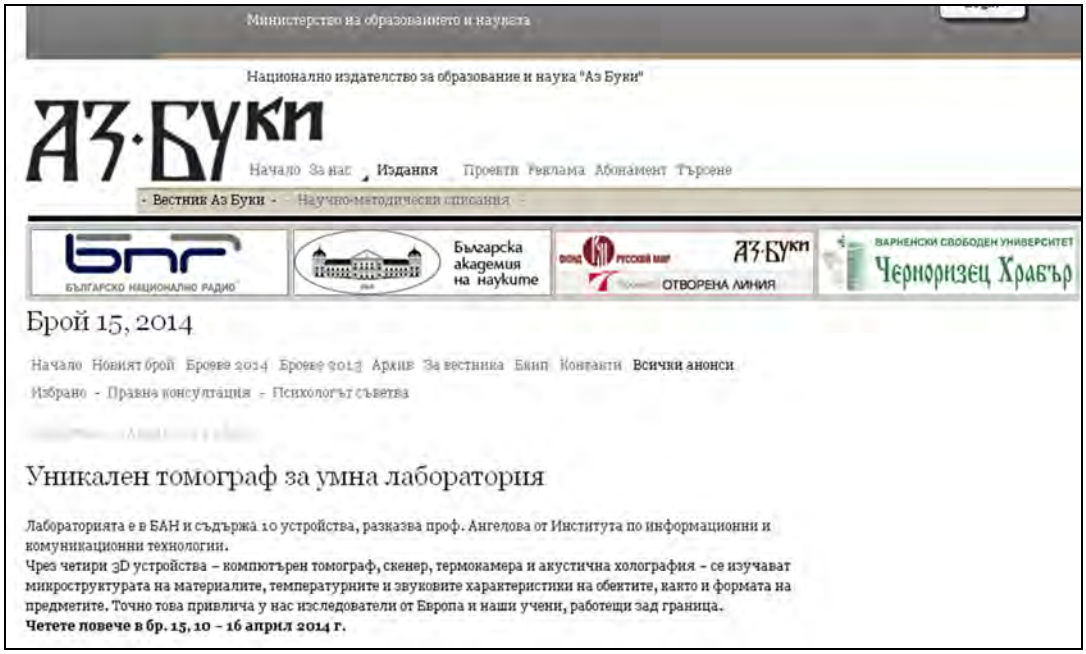
More photos of this visit can be found at http://www.iict.bas.bg/docs/17-02-2014/index.html

The project was also given publicity by the Bulgarian Television – BTV channel in its broadcasting devoted to the successful participation of IICT-BAS in the European research programmes.

The project achievements and the SmartLab devises were also covered by the National Bulgarian TV Channel 1 in its broadcasting devoted to the Doors Open Days organised by IICT-BAS (see http://bnt.bg/predavanyia/po-sveta-i-u-nas/po-sveta-i-u-nas-emisiya-12-00-29-mart-2014 after 9th minute).



After the Doors Open Day, the Newspaper АЗБУКИ (Alphabet) published an article about AComIn and Smart Lab in its No. 15, April 2014.



Министерство на образованието и науката

Национално издателство за образование и наука "Аз Буки"

АЗ·БУКИ

Начало За нас Издания Проекти Реклама Абонамент Търсене

Вестник Аз Буки | Научно-методически списания

БНР Българско национално радио | Българска академия на науките | Фонд Русский мир | Аз-Буки | Отворена линия | Варненски свободен университет Черноризец Храбър

Брой 15, 2014

Начало Новият брой Броеве 2014 Броеве 2013 Архив За вестника Екип Контакти Всички анонси

Избрано - Правна консултация - Психологът съветва

Уникален томограф за умна лаборатория

Лабораторията е в БАН и съдържа 10 устройства, разказва проф. Ангелова от Института по информационни и комуникационни технологии.

Чрез четири 3D устройства – компютърен томограф, скенер, термокамера и акустична холография – се изучават микроструктурата на материалите, температурните и звуковите характеристики на обектите, както и формата на предметите. Точно това привлича у нас изследователи от Европа и наши учени, работещи зад граница.

Четете повече в бр. 15, 10 – 16 април 2014 г.

The project results were also disseminated to a wide audience by including information about AComIn into a special poster in an Exhibition devoted to the 145th Anniversary of the Bulgarian Academy of Science. The poster is placed into a central square of Sofia and together with other posters illustrates the achievements of the Academy.

9. DEVIATIONS FROM SCHEDULE IN WP5

There are no serious and principal deviations for Period 1, except the fact, that:

- The cycles of seminars for Technology Transfer cannot be organised exactly in the periods February-March and July-August, as they have to be aligned with the schedule of the invited lecturers. In that sense, there might be dynamic changes in the TT seminars' schedules;
- According to a decision made by the AComIn Executive Board, the project Information Days are often aligned to other events running in the Bulgarian academic community in order to ensure synergy, exchange and cooperation (when this is feasible). For instance the Industrial Mathematics Information Day on 12 December 2013 was organised together with a meeting of the Bulgarian SIAM section. However, many events had not been not announced by mid-2012, at the time when AComIn has been negotiated, so there are little deviations in the programme of the AComIn information activities especially when they are collocated to events organised by 3rd parties.

The deviations foreseen for Period 2 are relatively minor too:

(i) A planned Workshop for 2014 in the AComIn DoW: May 2014: *the International Workshop on Control in Transportation Systems, a two-day event* will be shifted by 4 months for later dates.

Instead of May 2014, this Workshop will be organised in Sofia on 10-11 September 2014, together with a Training School of the COST Action Transport and Urban Development TU1102 (http://www.cost.eu/domains_actions/tud)

The change is made in order to ensure more active participation in the Workshop, attracting COST partners to present their research results at the AComIn event. The IICT senior Prof. Todor Stoilov, member of the AComIn core team and Bulgarian Representative in the Management Committee of the COST Action TU1102, will be the Chair of the Programme Committee of the Workshop "Control in Transportation Systems" and Responsible for the smooth coordination of the two events.

(ii) A planned Workshop for 2014 in the AComIn DoW: *September 2014: the International Workshop on 'Advanced Control and Optimisation, Step Ahead (ACOSA)', a two-day event* will be shifted by 4 months for earlier dates.

At the time when AComIn was negotiated, it was assumed that the ACOSA Workshop would be a co-located event with the International Conference on Intelligent Systems 2014, which had to take place in Bulgaria. However, meanwhile the venue of this conference has been changed – in 2014 it will take place on 24-26 September in Warsaw, Poland. Therefore, the AComIn Workshop ACOSA remains an independent event. To optimise the overall IICT schedule of events, the Executive Board of AComIn decided that it would be better to shift the Workshop to a more convenient period: 8-10 May 2014 in Bankya, Bulgaria.

10. ASSESSMENT OF THE ADDED VALUE OF ALL DISSEMINATION ACTIVITIES IN MONTHS 1-18

The objectives of the dissemination activities accomplished during the first period of the project were: *(i)* to inform regularly the EU ICT community about the AComIn results and the created new opportunities for cooperation with the IICT-BAS researchers and *(ii)* to promote the leading IICT-BAS technologies at regional and national levels. During these activities the results, work and achievements of the incoming experienced researchers were presented. In this way the successful cooperation on European and world level as well as the opportunities of doing ICT research in Bulgaria were promoted.

All dissemination activities presented in this document correspond to the planned tasks in the "AComIn Description of Work". The created project website hosts the information on objectives and planned activities, the project results and the list of present and incoming events. The site provides on-line information on all aspects and keeps documents, presentations, pictures, and other relevant information on AComIn. It also contains information on AComIn User Communities as well as Electronic newsletters oriented towards the academic audience as well as towards industrial readers. In this way the website has created links to all relevant scientific, industrial and governmental institutions.

During the reporting period AComIn has disseminated the project results to a broad scientific audience within 5 scientific events. Two of them belong to world-wide renowned series of International Forums: Large Scale Scientific Computations (LSSC) and Recent Advances in Natural Language Processing (RANLP); the other 3 events are workshops oriented mainly towards Bulgarian academic and industrial communities: The National workshop "ICT for Human Health and Quality of Life" (ICT-HuHeQuL'13), The International workshop on Autonomic Computing and Automatic Control in Computer Systems (ACACCS'13) and The National workshop "ICT for New Materials and Nano Technology" (NewNano'13).

The LSSC-2013 and RANLP-2013 Conferences were attended by 314 participants, 23 of them were supported by AComIn. At these conferences 12 AComIn-related papers were presented and published.

The three workshops ICT-HuHeQuL'13, ACACCS'13 and NewNano'13 were attended by 94 participants, 65 of them were supported by AComIn. Some 17 AcomIn-related papers were presented and published in the workshops proceedings or scientific journals.

The organisation of all scientific events supported by AComIn can be assessed as successful. They have contributed to strengthening the scientific cooperation of IICT-BAS on the European and world levels, as well as promoting IICT-BAS as an attractive place for doing ICT research.

In order to raise awareness about novel technologies enabled by AComIn and to promote the potential of the SmartLab devices, six technology transfer seminars were organised. Two of them ("Computational Vision and its Application to Medical Diagnosis" and "Video segmentation: applications to medical imaging and life-logging data") were intended for the user community on Advances in Image and Video Analysis. The seminars were attended by 46 participants.

Two other seminars ("Applying advanced 3D computer technologies in the textile industry and fashion" and "3D scanning and digitalization") were oriented towards the user community on Advanced 3D Technologies. These seminars were attended by 62 participants.

The technology transfer seminar on Industrial Mathematic was organised in collaboration with Fraunhofer ITWM, Kaiserslautern, Germany (a partner in the AComIn project). The seminar was attended by 32 participants.

The "Thermography – making and analysing thermograms with FLIR P640 Thermo camera" seminar was oriented towards the user community on Advances in Thermography. The seminar was attended by 19 participants.

The results of all these technology transfer seminars can be evaluated as very successful since they allowed strengthening the existing and creating new contacts of IICT-BAS researchers with Bulgarian industrial organisations, their regional branches as well as with individual professionals from various spheres. These contacts have served as a basis for initiating some pilot projects in the area of Industrial mathematics and 3D digitalisation.

Promoting AComIn in the society has been achieved by organising 3 events: the first one was a non-scientific Stakeholder meeting, to which representatives of the national Government, regional authorities, Sofia municipality, the National Science Found, NGOs, industry organisation, etc. were invited. During the meeting discussions were held concerning how AComIn activities could better target the needs of policy makers and the industry.

The Information Day that was organised along with the Second Steering Committee Meeting was aimed at demonstrating the project achievements and receiving a professional evaluation of the project progress from the project partners. The conclusion was that the project had started in an excellent way and that IICT-BAS had succeeded in attracting several excellent post-docs who had the potential to become future team leaders. The project has also forced the Institute to adopt good practices in innovation and to develop related normative documents, which is an extremely positive project effect.

The Doors Open Days were organised as a wide-scale dissemination event aiming at demonstrating the potential the Smart Lab equipment and attracting young researchers from near-by countries to apply to post-docs positions in IICT-BAS. The event was preceded by a cycle of lectures given by scientists specially invited by AComIn's Executive Committee. A total of 14 scientists from Serbia, Macedonia, Romania, the Ukraine, Greece and Turkey were invited and took part in the event. Currently one of them – Dr. Vladimir Kudriashov from the Laboratory for Nonlinear Dynamics of Electronic Systems, Institute for Radiophysics and Electronics, National Academy of Sciences of Ukraine, Kharkov had applied for a post-docs position in AComIn and was approved by the AcomIn Executive Committee.

The Doors Open Days were attended by more than 120 visitors from 30 academic and industrial organisations and was also covered by the National Bulgarian TV Channel 1. The event can be assessed as a very successful one and has resulted in creating new contacts with scientific as well as industrial organisations from Bulgaria and abroad. Several ideas for joint scientific and application-oriented projects exploring the SmartLab devices have been proposed and are in the phase of development. Several key AComIn researchers have been invited to visit universities from near-by countries to present in more detail the AComIn results and achievements.

APPENDIX A

A1. LIST OF THE STAKEHOLDERS MEETING PARTICIPANTS

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A2. LIST OF PARTICIPANTS IN THE 1ST INFORMATION DAY

Prof. Asen Asenov	Gold Standard Simulations Ltd. & University of Glasgow, Device Modelling Group
Prof. Virginio Cantoni	Computer Vision & Multimedia Lab CVML, University of Pavia
Prof. Ivan Kalaykov	Centre for Applied Autonomous Sensor Systems, School of Science and Technology, Örebro University
Prof. Markos Papageorgiou	Dynamic Systems and Simulation Laboratory, Department of Production Engineering and Management, TU Crete
Prof. Svetozar Margenov	Institute of Information and Communication Technologies - BAS
Prof. Kostadin Kostadinov	Bulgarian Cluster of Mechatronics
Prof. Ivan Dimov	Institute of Information and Communication Technologies - BAS
Prof. Galia Angelova	Institute of Information and Communication Technologies – BAS
Prof. Todor. Stoilov	Institute of Information and Communication Technologies – BAS
Prof. Dimitar Karastoianov	Institute of Information and Communication Technologies – BAS
Assoc. Prof. Gennady Agre	Institute of Information and Communication Technologies – BAS
Assoc. Prof. Krassimir Georgiev	Institute of Information and Communication Technologies – BAS
Assoc. Prof. Kiril Alexiev	Institute of Information and Communication Technologies – BAS
Assoc. Prof. Vladimir Monov	Institute of Information and Communication Technologies – BAS
Assoc. Prof. Rumen Andreev	Institute of Information and Communication Technologies – BAS
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A3. LIST OF ICT-HUHEQUL'13 WORKSHOP PARTICIPANTS

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Assist. Prof. Gergana Bencheva	Institute of Information and Communication Technologies - BAS
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Dr. Ventzislav Slavkov.	Spesima GmbH
Dr. Gocho Slavov	Spesima GmbH
Dr. Jivko Angelov	Adis Lab
Prof. Dr. Vitan Galabov	TU-Sofia
Dr. Stefan Pavlov	Cluster
Dr. Dimitar Chipev	BIA/BCCI
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Assoc. Prof. Stanislav Simeonov	University of Chemical Technology - Burgas
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Assoc. Prof. Kamen Dimov	Agricultural academy
Assist. Prof.Cveti Kostadinova	Institute of Mechanics – BAS
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Mrs. Svetla Karastoinova	Chief Secretary, Regional Health Inspection -Stara Zagora
Mrs. Antonia Todorova	Municipality – Stara Zagora
Mrs. Slavka Jordanova	Director of Regional Health Insurance Fund – Stara Zagora
Mrs. Desislava Delcheva	Regional Health Inspection -Stara Zagora
Eng. Boika Taneva	Regional Health Inspection -Stara Zagora
Mrs. Ivanka Sotirova	Deputy Mayor – Stara Zagora
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Dr. Nayden Chivarov.	Institute of System Engineering and Robotics - BAS

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Prof. M. Wack	Universite de Technologie de Belfort Montbéliard
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Assist. Prof. Elena Paunova	Institute of Information and Communication Technologies - BAS
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PhD student Elisaveta Trichkova	Institute of Information and Communication Technologies - BAS
PhD student Vladimir Ivanov	Institute of Information and Communication Technologies - BAS
PhD student Stoian Mishinev	Institute of Information and Communication Technologies - BAS
PhD student Peter Stoyanov	Institute of Information and Communication Technologies - BAS
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Assoc, Prof. Andrej Yonchev	Technical University of Sofia
PhD student Vassilka Stoilova	Technical University of Sofia
PhD Student Gergana Yordanova	Technical University of Sofia
Dr. Zhivko Angelov	ADISS Lab OOD

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Assoc. Prof. Tony Boiadjiev.	Institute of Information and Communication Technologies - BAS
Assoc. Prof. Michail Mihov	Institute of Information and Communication Technologies - BAS
As. Ivan Altaparmakov	Institute of Information and Communication Technologies - BAS
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Assist. Prof Dencho Pirinchev	Institute of Information and Communication Technologies - BAS
Assist. Prof Stojan Arshinkov	Institute of Information and Communication Technologies - BAS
Assist. Prof. Bijo Bijev	Institute of Information and Communication Technologies - BAS
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Prof. Lubomir Dimitrov	Dean of Machine Faculty, TU Sofia
Prof. Vitan Galabov	TU-Sofia
Prof. Dr. Todor Neshkov	TU-Sofia
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Assoc. Prof. Luben Klochkov	TU-Sofia