AComIn:
Advanced Computing for Innovation

FP7 Capacity Programme
Research Potential of Convergence Regions

D 3.1
Networking – Month 18

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EXECUTIVE SUMMARY

Networking with leading EU Research Centres is a vital part of the AComIn enterprise. It underpins the Human Resource Development. Four ways of networking are planned in AComIn:

(i) networking with the partnering organisations,

(ii) networking by attending international conferences with accepted papers as well as exhibitions with stands and demonstrators,

(iii) attending information events (e.g. Doors Open Days) and contact building events like the EC Information days etc. and

(iv) attending short training events and training devoted to innovation capacity development.

These networking activities are organised in two main tasks:

(i) *Task 3.1: Networking with the partnering organisations*, which is implemented via two-way secondments and short two-way visits; and

(ii) *Task 3.2: Attending conferences, exhibitions, information and training events*.

Three outgoing secondments to partnering sites were implemented in months 1-18 (out of 24 planned with average duration of 2 months). We note that the Bulgarian national legislation offers built-in mechanisms (contractual clauses and restrictions) so as to guarantee staff return after long leaves abroad. There is an extensive Contingency plan on how to implement the remaining outgoing secondments, as well as the incoming secondments, in project months 19-36.

Regarding short visits (two way exchange, participation in events) AComIn is moving with acceleration. During the first project period 29 incoming short visits were organised. Scientists from 13 countries visited IICT. During their visits they prepared joint papers, gave lectures at IICT seminars and participated in the AComIn Doors Open Days. Some 17 lectures were delivered at AComIn seminars. The first AComIn Technology Transfer (TT) Workshop was organised with lecturer Prof. Petia Radeva from the Autonomous University in Barcelona.

Eight outgoing short visits of IICT experienced scientists were implemented. Two joint papers were prepared during these visits, 5 talks were given, three IICT experienced researchers visited project partners to prepare future joint work, and a meeting of a COST Action was attended to establish liaison between AComIn and the COST Action topics.

During AComIn months 1-18, 32 experienced researchers participated in 33 international scientific events (31 of them peer-reviewed conferences and workshops, one European Exhibition with reviewed exhibits and one Lab Surfing Event of a FET-oriented project for Young researchers). In total, these researchers gave 64 presentations. As result, 54 peer reviewed papers were published in the respective event Proceedings. Please note that AComIn experienced researchers attend conferences without presentation of accepted papers quite rarely, as an exception only, with a decision of the AComIn Executive Board.

Attending information events in the EU is considered by the AComIn team as an extremely important activity as it enables the IICT seniors to establish new useful contacts, to build new consortia, to consolidate already existing working contacts and – last but not least – to promote AComIn and its achievements. The Information events which took place in 2013 were especially important since Horizon 2020 was launched at such an event. Eleven visits of IICT experienced researchers to eight

events have been implemented. Two events are related to participations in International consultative bodies and three – to Information days related to the launched Horizon 2020 programmes.

In summary, the following figures present the WP3 activities in period 1:

Secondments to partnering sites: 3 (2 to ITWM, Kaiserslautern and
                                                    1 to the University of Pavia).

Papers published as result of WP3 activities: 54 after attendance in Conferences;
                                                    2 prepared as joint work in Secondments

Seminar lectures delivered in IICT or abroad: 22 while implementing short visits;
                                                    6 during secondments;
                                                    64 delivered by IICT experienced researchers at
                                                    conferences and workshops attended via WP3

Visiting foreign scientists: 24, including 3 candidates for AComIn Post-doc
                                                    positions

Visiting lecturers for TT Workshops: 1, for a TT event with a duration of several days

Attendances to conferences and workshops: 32 experienced researchers participated
                                                    in 33 international scientific events

**Attendances in Information events that
enable participation in Consultative Bodies
or H2020 programmes**:   5

Participations to a JRC Event (Open Day):   2

The AComIn Executive Board created a standardised procedure for implementation of WP3 mobilities. It includes obligatory delivery of final reports to be uploaded at the project site, together with detailed information about the respective event or mobility purpose. In the Team Area under *Reports - WP3* there are pages for each type of mobilities. The print-screens are included in the relevant sections as illustrations.

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Summary	This report presents the result of networking activities performed during the first period (m1–m18) in the project AComIn. Three kinds of networking activities are described: *(i)* networking with the partnering organisations, *(ii)* networking by attending international conferences with accepted papers as well as exhibitions with stands and demonstrators, and *(iii)* attending contact building events like the EC Information days etc. The Added Value of the networking activities is assessed. Deviations from schedule and contingency plan are discussed as well.
Keywords	Networking, secondments, short visits, invited talks, conferences, exhibitions, information events, added value

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1 INTRODUCTION

One of the main AComIn objectives is to strengthen the IICT research and innovation capacity by increasing the knowledge and skills of the experienced IICT researchers. More specifically, AComIn organises efficient networking with the partnering institutions and knowledge exchange with established ICT experts including: two-way secondments and short two-way visit exchange between IICT experienced researchers and the partner organisations as well as motivated participation of IICT experienced researchers in prestigious international scientific events (conferences, workshops, etc.), contact building events like the EC Information Days, etc., training events and exhibitions. It is stated in the AComIn Technical Annex that the Networking in the Work Package 3 (WP3) is implemented via two Tasks:

- *Task 3.1* (Networking with the project partners) and
- *Task 3.2* (Networking to attend various kinds of events).

Secondments are defined as "*detachments of persons from their regular organisation for temporary assignment elsewhere*".

This deliverable presents the AComIn Networking activities in months 1-18. According to the Technical Annex, participation in events needs to be reported together with the event programme, participant list and presentation given by the IICT researchers for each attended event. Here we only overview event participations in order to simplify the documentation. The required details about attended events are stored in the AComIn Team Area under *Reports*, *WP3*. Print-screens of the pages will be shown in the relevant sections.

2 SECONDMENTS

Secondments are planned so as to enable the specialisation and training of the experienced IICT researchers at the partnering organisations, esp. regarding technologies related to the use of the Smart Lab devices and in order to initiate new joint research activities. Secondments are also viewed as an opportunity to support IICT scientists in establishing links with innovation absorbing industrial organisations and Users from the Public sector, by understanding the approach of the AComIn partners and adapting it to the IICT needs. Figure 1 shows the page in the Team Area where information about the Secondments is stored, under *Reports, WP3 Mobilities – Secondments*.

Three secondments have been implemented for the first period of the AComIn project. We present here a brief description of these mobilities: the partner, period, the aim and results. The remaining secondments of the planned schedule, both outgoing and incoming, will be organised in AComIn months 19-36.

Prof. Dr Krassimir Georgiev visited the Fraunhofer Institute for Industrial Mathematics (Institut für Techno- und Wirtschaftsmathematik - ITWM), Department of Flow and Material Simulation (Kaiserslautern, Germany) in the period 3–26 March 2013. The host professor from ITWM was prof. Oleg Iliev, an AComIn partner. During Dr. Georgiev's visit he was working together with the German colleagues in the field of mathematical and computer modelling of some convection-diffusion-reaction problems in porous media and their efficient implementation on parallel computers. Dr. Georgiev participated in discussions about the future joint research between the two groups in the area of scientific computing and development of new supercomputer applications for industry, medicine and ecology. He gave a seminar talk on „Scientific and Parallel Computing in IICT–BAS: Infrastructure,

Figure 1. Supporting information about Secondments in the Team Area of the project site

Projects, and Results". Some research results, achieved during this secondment, are reported in the paper:

> K. Georgiev, N. Kosturski, Y. Vutov, *On the Adaptive Time-Stepping in Radio-Frequency Liver Ablation Simulation: Some Preliminary Results*, to appear in LNCS 8353 (2014), ISSN 0302-9743 **SJR 0.332**

Other results will be included in further publications that are in preparation in 2014.

Dr Yavor Vutov visited the Fraunhofer Institute for Industrial Mathematics (Institut für Techno- und Wirtschaftsmathematik - ITWM), Department of Flow and Material Simulation (Kaiserslautern, Germany) in the period 3 March – 30 April 2013. The host professor from ITWM was prof. Oleg Iliev. During this visit Dr Vutov has implemented:
- a surface reaction module in a finite volume filter simulation;
- an adaptive time-stepping scheme in a finite element ablation simulation;
- a numerical homogenisation scheme for anisotropic linear elastic materials.

He has also developed software for:
- surface reaction module added to a finite volume filter simulation;
- adaptive time-stepping scheme added to an instructed 3D FEM solver;
- a numerical homogenisation tool developed for anisotropic linear elastic materials.

Results from this secondment were reported in the following two papers:

> K. Georgiev, N. Kosturski, Y. Vutov, *On the Adaptive Time-Stepping in Radio-Frequency Liver Ablation Simulation: Some Preliminary Results*, to appear in LNCS 8353 (2014), ISSN 0302-9743 **SJR 0.332**

> N. Kosturski, S. Margenov, Y. Vutov, *Calibration of Parameters for Radio-Frequency Ablation Simulation*, to appear in LNCS 8353 (2014), ISSN 0302-9743 **SJR 0.332**

Prof. Dr. Dimo Dimov visited the Computer Vision and Multimedia Lab (CVML) of the University of Pavia, Italy in the period 13 May - 14 June 2013. The host professor from CVML was prof. Virginio Cantoni, Director of CVML. The main aim of this secondment was to carry out joint research and to plan further collaboration between the two institutions within the AComIn project. During his visit Prof. Domov gave the following lectures (available on the CVML site http://vision.unipv.it/events/):

- "*IICT, BAS, Sofia, AComIN, and SP&PR department*" (on May 20, 2013);
- "*Rapid and Reliable Content Based Image Retrieval (or FANTIR – Fast & Noise Tolerant Image Retrieval)*" (on May 29, 2013);
- "*From 2D CBIR to Multi View Based 3D Recognition*" (on June 04, 2013); and
- "*Precise Approximation of (ρ,θ)-Hough Transform over a Rectangular Grid*" (on June 10).

The last presentation considers a concrete opportunity for a collaboration in Proteomics that was confirmed also in the final protocol for the visit in Pavia.

The main contributions to the AComIn project objectives are as follows:

- An agreement to use the MV3R (Multi View Based 3D Recognition) method of IICT as a promising approach that can be applied to a set of problems in Biometrics and/or Cultural heritage preservation. Plans how to use the MV3R method in future joint work;
- Plans for joint work on a Proteomics application of the so-called "exact $(ρ,θ)$-HT". The exact $(ρ,θ)$-HT will be used also as an user test for the Industrial Computer Tomograph;
- Promotion of the AComIn project in the Electrical Faculty of the University of Pavia, by giving talks, disseminating promotional materials etc.

The schedule of further activities includes:

- Agreement for joint organisation of a Workshop in Biometrics in June 2014;
- Preliminary plan for the visits of Prof. Cantoni to Sofia in 2014.

3 SHORT VISITS AND EXCHANGE BETWEEN IICT AND EU CENTERS

The visits (both incoming and outgoing) were aimed at exchanging and sharing research results and experience as well as discussing the challenges and adopted solutions in accomplishing the main objectives of AComIn. Short visits supported participation in working seminars with invited lectures. During these short visits 22 seminar lectures were organised, which included high quality presentations in the fields related to the AComIn project objectives (advanced computing, language and semantic technologies, signal and image processing and optimisation and intelligent control). In addition, during the visits of Prof. Petia Radeva from the Autonomous University of Barcelona (UAB), the first Technology Transfer Workshop was held for several days. Prof. Radeva gave in fact training courses with industrial orientation where not only the IICT specialists but many external researchers participated (see a detailed description of this course in D2.3 "Building User Communities").

Moreover, several joint papers were prepared and some others were completed and submitted to high quality scientific journals or to highly ranked international conferences.

These visits also enabled job interviews with candidates for AComIn post-doctoral positions, three approved candidates for post-doc positions visited IICT with this purpose.

3.1 Incoming short visits

During the first project period 29 short incoming visits were organised. Scientists from Slovakia, France, Spain, UK, Italy, Iran, Sweden, Romania, Germany, FYROM, Serbia, Greece and Ukraine visited IICT. During their visits they prepared joint papers, gave lectures at IICT seminars and participated in the AComIn Doors Open Days. Some 17 lectures were delivered at AComIn seminars and the first AComIn Technology Transfer Workshop was organised with lecturer Prof. Petia Radeva. The list of visits and reports about the joint activities can be found in the Team Area, under *Reports*, *WP3 Mobilities: Incomming Short Visits* (see Fig.2).

Figure 2. Reports about incoming short visits in project months 1-18

Prof. Oleg Iliev (Fraunhofer Institute of Industrial Mathematics (ITWM), Kaiserslautern, Germany, AComIn partner) visited IICT in the period 26-29 December 2012. During this short visit Prof. Iliev presented some recent research activities at ITWM which could be of common research interest within the implementation of AComIn Advanced Computing agenda. Among others, the topic of computer modelling of interface conditions in membrane filtration processes was discussed. As a part of the performed joint work, the losses of heat through the blood flow in big vessels were discussed, in the context of computer simulation of radiofrequency hepatic tumour ablation. The draft Working Plans for the secondments of Assoc. Prof. Krassimir Georgiev and Assist. Dr. Yavor Vutov in April-May 2013 at ITWM were coordinated.

Prof. Petrica C. Pop (Department of Mathematics and Computer Science, Technical University of Cluj-Napoca, North University Centre of Baia Mare) visited IICT in the period 4–7 March, 2013. During this short visit Prof. Pop presented his recent achievements in the field of definition and solution of optimisation problems related to the transport services: problems with optimisation of transport flows, minimisation of bounded graphs, optimal routing and warehouse allocation. He gave two talks at seminars on the topics "*Research trends in combinatorial optimisation*" and "*On the generalised vehicle problem*". These presentations are available at the AComIn site under menu *News* at the URL http://iict.bas.bg/acomin/news.html.

Prof. Franziska Kluegl (University of Örebro, Sweden, AcomIn partner) visited IICT in the period 20–22 May, 2013. The visit aims were to exchange and share experience and research results as well as to discuss the practical challenges and solutions in the area of Optimisation and Intelligent control. Prof. Kluegl participated in a scientific seminar and gave a lecture "*Use of Multiagent Systems in Simulation*". As a whole Prof. Kluegl's visit was a useful event allowing for exchange of knowledge and experience between the partners and specifying topics for joint research in the area of multiagent systems in accordance with the research activities of the AComIn project. The presentation is available at the AComIn site under menu *News* at the URL http://iict.bas.bg/acomin/news.html.

Dr. Ayyoob Jafari (Qazvin Islamic Azad University, Iran) visited IICT in the period 20-23 May, 2013. During his visit he gave the following three presentations:
- *Speech Processing Experiences,*
- *Biomedical Signal Processing Experiences*, and
- *Web-based Power Plants Vibration Diagnosis System.*

An interesting attitude in his projects was their practical orientation and the intent to align research to market requirements. Based on his achievements and the intensive discussions with IICT researchers, a positive decision about his eventual employment as a post-doc in AComIn has been made. Dr. Jarafi will receive a job invitation when the installation of the AComIn Speech Lab is completed (expected after June 2014). His presentations are available at the AComIn site under menu *News* at the URL http://iict.bas.bg/acomin/news.html.

Prof. Virginio Cantoni (University of Pavia, Italy) visited IICT in the period 24 June – 4 July 2013. Prof. Cantoni is the Director of the Computer Vision and Multimedia Lab (CVML) of the University of Pavia, a partner in AComIn. During his visit Prof. Cantoni presented a lecture on "*A Few Applications of Pattern Recognition Techniques to Proteomics*" at the seminar of the Signal Processing and Pattern Recognition department of IICT. A joint paper, titled "Structural Blocks Retrieval in Macromolecules: Saliency and Precision Aspects" with authors Virginio Cantoni and Dimo T. Dimov was prepared and submitted for review to the 2nd International Workshop on Pattern Recognition in Proteomics, Structural Biology and Bioinformatics (PRPSBB'2013), 09-10.09.2013, Naples, Italy. Prof. Cantoni participated in the 14-th International conference *CompSysTech*, 28-29 June, 2013, Rouse (Bulgaria). The presentation "*A Few Applications of Pattern Recognition Techniques to Proteomics*" is available at the AComIn site under menu *News* at the URL http://iict.bas.bg/acomin/news.html.

Dr. Salvatore Amoroso (University of Glasgow, UK) visited IICT in the period 19–28 July, 2013. He worked jointly with experienced IICT scientists on several simulations and finalised one paper (*"Electron dynamics in nanoscale transistors by means of Wigner and Boltzmann approaches"*) that was recently published in Physica A, Elsevier, and one abstract ("*Quantum Insights in Gate Oxide Charge-Trapping Dynamics in Nanoscale MOSFETs*") for the conference SISPAD 2013 (Glasgow, September 2013). The talk at SISPAD 2013 was very well accepted by the semiconductor engineering community and helped the IICT researchers to spread the word about their results around the

community. Thanks to this, several collaboration with European groups were started. Dr. Amoroso collaborated with Prof. Dimov and the AComIn post-doc Dr. Jean Michel Sellier; their joint results are presented in the deliverable D1.1.

Prof. Petya Radeva (Universitat Autònoma de Barcelona, UAB, Spain) visited IICT twice – from 21 July to 10 August, 2013 and in the period 14-20 January, 2014. Prof. Radeva is a leading expert in image processing. She heads the Barcelona Perceptual Computing Lab at UAB as well as the Medical Imaging Lab of the Computer Vision Centre in Barcelona. The main result of the **first visit** was the Technology Transfer Workshop on „*Computational Vision applied to Medical Diagnostics*" (24-26 July 2013) conducted as a 14-hours course. The Workshop was open for all researchers interested in the field, from the institutes of the Bulgarian Academy of Sciences (BAS), universities, public and/or private companies, etc. It attracted 33 participants. More details about the Workshop are given in the deliverable D2.3 "Building User Communities".

The main objective of her **second visit** was to deliver further lectures on "Advances in Image and Video Analysis" in a seminar „*Video segmentation: applications to medical imaging and life-logging data"*. The lectures gathered 13 participants, most of them from the AComIn User Community in "Advances in Image and Video Analysis". The lectures given by Prof. Radeva are available on the AComIn site under menu *News* at the URL http://iict.bas.bg/acomin/news.html. (TT Workshop)

Prof. František Čapkovič (Institute of Informatics, Slovak Academy of Sciences, Bratislava, Slovakia) visited IICT in the period 29 September – 6 October 2013. Prof. Čapkovič presented his research on "Cooperation of Agents in Complex Systems Based on Supervision" that provoked a well-deserved interest. In the framework of his research visit in IICT, Prof. Čapkovič gave a public lecture titled "*Modelling, Analysing and Petri Net-Based Supervision of Agents in Complex Systems*" which raised fruitful discussions and interest in further deepening the research contacts between our two institutes. The presentation is available in the Team Area under *Reports*, *WP3*, *Incoming Short visits*.

Prof. Jacques Richalet (ADERSA, France) visited IICT in the period 29 September – 9 October 2013. The visit was aimed at exchanging and sharing experiences and research results in the field of Optimization and Intelligent control. Prof. Richalet, also known as the "father of predictive control", presented his latest achievements and practical results if the model predictive control of various production processes in the chemical industry. He had meetings and useful discussions with leading scientists from the IICT departments of "Intelligent systems" and "Modeling and Optimisation". He gave a lecture titled "*Industrial applications of predictive functional control*". The presentation is available in the Team Area under *Reports*, *WP3*, *Incoming Short visits*.

Prof. Vassil Alexandrov (Barcelona Supercomputer Centre, Department of Computer Science, Spain) visited IICT in the period 4 – 12 October 2013. During his visit he discussed his recent achievements in the field of the Monte Carlo SPAI pre-conditioners. The advantage of this method is that the same approach is applied to sparse and dense matrices and that complexity of the Monte Carlo matrix inversion is linear of the size of the matrix. Prof. Alexandrov participated in a scientific seminar and gave a lecture entitled "*On Scalability Behaviour of Monte Carlo Sparse Approximate Inverse and Hybrid Algorithms for Matrix Computations*". Information about his lecture is available in the Team area of AComIn under *Reports*, *WP3*, *Incoming Short visits*.

Prof. Konstantin Lukin and ***Dr. Volodimir Kudriashov*** (National Academy of Sciences of Ukraine, Kharkov) visited IICT for the period 24 – 30 March 2014. Prof. DSc Konstantin Lukin is IEEE Fellow and the Head of the Laboratory for Nonlinear Dynamics of Electronic Systems at the Institute for Radiophysics and Electronics. 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 raised interest in further deepening the research contacts between the two institutes. Dr. Volodimir Kudriashov gave a lecture titled "*Radiometric Synthetic Aperture Radar*". Dr. Kudriashov intends to apply for a post-doctoral position in AComIn.

Prof. Gökhan Çuvalcioğlu (Department of Mathematics, Mersin University, Turkey) visited IICT in the period 26 – 30 March 2014. Prof. Çuvalcioğlu is expert in fuzzy sets and their application in the area of intelligent control. He did joint research with Prof. L. Doukovska and attended the Doors Open Day of AComIn on 28 and 29 March. He also discussed the requirements for post-doctoral students in AComIn and will take care to disseminate the information about the project in Mersin University.

Prof. Biljana Krsteska (Faculty of Natural Sciences and Mathematics at the St. St. Cyril and Methodius University in Skopje, Former Yugoslav Republic of Macedonia) visited IICT in the period 26 – 30 March 2014. Her visit aimed at exchanging and sharing experience and research results with Prof. Doukovska, as well as participation in the Doors Open Days of AComIn on 28 and 29 March 2014. Prof. Krsteska will disseminate information about AComIn and its open positions in the St. St. Cyril and Methodius University in Skopje.

Prof. Sofia Panteliou from Patras University, Greece visited IICT in the period March 26-30, 2014. Prof. Panteliou participated in a scientific seminar and gave a lecture titled "*Design, Biodesign, Applications*" discussing the design systems, elements of biological simulation models, applications in bio-modelling and bio-models of human bones. The visit of Prof. Panteliou was a useful event allowing exchange of knowledge and experience and specifying topics for joint research in the area of modelling of biological objects (using the 3D Tomograph and the 3D Scanner) in accordance with the planned research activities of AComIn. Prof. Panteliou is also interested in joint tasks enabling to use the AComIn tomograph. Information about her lecture is available in the Team area of AComIn.

Prof. Felix Yanovsky and ***Prof. Rustem Sinitsyn*** visited IICT in the period 26 – 31 March 2014. Prof. DSc Felix Yanovsky is an IEEE Fellow and Head of the Electronics Department at the National Aviation University in Kiev, Ukraine. During his visit Prof. Yanovsky gave a lecture titled "*Researches in the field of Radar and related areas in the Electronics Department at the National Aviation University of Ukraine*". Dr. Rustem Sinitsyn from National Aviation University in Kiev, Ukraine presented the lecture "*Non-Parametric algorithms of signal processing for active and passive MIMO noise acoustic radars*". The two lectures raised fruitful discussions and interest to intensify further the research contacts between the two institutes. The guests took part in the AComIn Doors Open Days and more especially in the demonstration of the Smart Lab Acoustic Holography. Information about their lectures is available in the Team area of AComIn.

Yuriy Chyrka (National Aviation University, Kiev, Ukraine) visited IICT in the period 26 March – 2 April 2014. Yuriy holds a Doctoral Degree of the National Aviation University. During his visit he gave the talk "*Harmonic signal parameters estimation*". Yuriy is interested in the 3D laser scanner, the tomograph and the acoustic holography. His visit was a good starting point for collaboration with IICT researchers. He also met the members of the "Mathematical Methods for Sensor Information Processing" Department. More details about his visit are available in his report in the Team Area of AComIn Site under *Reports*, *WP3*, *Incoming Short visits*.

Prof. Viktor Gavriloski (Skopie University, FYROM) visited IICT in the period 27-29 March 2014. The visit was aimed at exchanging and sharing experience and research results. During his visit, Prof. Gavriloski had meetings and discussions with leading scientists from IICT. The visit of Prof. Gavriloski was a useful event allowing for exchange of knowledge and experience and specifying topics for joint

research in the area of mechanics and mechatronics (with the use of the Thermo Camera and the High Speed Camera) in accordance with the planned research activities of the AComIn project. On 28 March 2014 he took part in the AComIn Doors Open Days.

Prof. Costin Badica and **Prof. Marian Cristian Mihaescu** (Faculty of Automatics, Computers and Electronics, Software Engineering Department), as well as **Dr. Mihaela-Tinca Udristioiu** (Faculty of Physics), all of them from the University of Craiova, Romania visited IICT-BAS on 27-29 March 2014. 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). On 28 March 2014 they took part in the AComIn Doors Open Days.

Prof. Veno Pacovski (University American College – Skopje, FYROM), visited IICT-BAS on 27-29 March 2014. Prof. Pacovski is now the Vice-Dean of the School of Computer Science and Information Technology in the University American College – Skopje. During his short visit he discussed the requirements to candidates for post-docs employment in AComIn project in order to inform prospective post-doctoral researchers from Skopje about the open positions. On 28 March 2014 he took part in the AComIn Doors Open Days.

Prof. Vlastimir Nikolic (Nis University, Serbia) visited IICT in the period 28-29 March 2014. The visit of Prof. Nikolic was aimed at exchanging and sharing experiences and research results. Based on the Smart Lab equipment, potential collaboration in the context of the project tasks was discussed as well as the potential employment in AComIn of post-doctoral researchers from Nis.

3.2 Outgoing short visits

During the first project period eight outgoing short visits of IICT scientists to the partner's institutions were organised (see Fig. 3). Two joint papers were prepared during these visits, 5 talks were given, three IICT experienced researchers visited a project partner to prepare future joint work, and a meeting of a COST Action was attended to establish liaison between AComIn and the COST Action topics.

Dr Irina Temnikova, a post-doctoral researcher employed in AComIn, visited Thessaloniki, Greece attending the Working Group meeting of the COST Action MUMIA (Multilingual and Multifaceted Interactive Information Access) on 12-14 December 2012. She gave a talk about future research plans in extracting a terminological database from Wikipedia in order to linguistically enrich mono- and multilingual patent retrieval. The idea was presented to a mixed audience of computational linguists, computer scientists and European patent experts and received valuable interdisciplinary feedback and suggestions on how to improve our methods. Dr. Temnikova has also established contacts with Dr. Barrou Diallo, Head of Research at the European Patent Office (EPO), with whom they planed to start collaboration in 2013, as well as with representatives of foreign universities and private companies.

Prof. Dimitar Karastoyanov, Prof. Vladimir Monov and **Prof. Lyubka Doukovska** were on a working visit at the University of Őrebro, Sweden in the period 15–29 September 2013. The visit was aimed at exchanging and sharing experiences and research results as well as discussing the practical challenges encountered and the solutions adopted in accomplishing the main objectives of the AComIn project. They gave a lecture titled "*Advanced Computing for Innovation*" in a seminar, organised by the School of Science and Technology and the Centre for Applied Autonomous Sensor Systems (AASS). They presented current results achieved within AComIn as well as some results and research activities of the IICT departments "Embedded Intelligent Technologies", "Modelling and Optimisation" and "Intelligent Systems". Several work meetings and discussions were carried out with

Figure 3. Outgoing short visits to attend scientific seminars with invited talks,
a COST meeting with presentation and to visit a partnering University

Prof. I. Kalaykov, contact person in the AComIn partnership with the Őrebro University, Prof. D. Driankov, Director of the Centre AASS, Prof. Franziska Kluegl and Prof. Anani Ananiev. In addition the AComIn seniors visited the Alfred Nobel Centre in Karlskuga, Sweden, where the latest achievements of robotics, computer science and computer simulations were demonstrated.

Prof. Ivan Dimov and ***Dr. Jean Michel Sellier*** visited in the period 17-21 November 2013 the research group, dedicated to semiconductor device modelling at IMEC and the group dedicated to Theoretical Physics, both headed by Professor Wim Magnus in Leuwen and Antwerp, Belgium. The purpose of this visit was to present the last results of research done in IICT in the field of three-dimensional Wigner–Boltzmann simulations. They attended two scientific seminars (in IMEC and in University of Antwerp) and gave lectures titled "*The Wigner Monte Carlo Approach: From Theory to Applications*". The two groups at IMEC and at the University of Antwerp (UA) responded very well to the results presented and they expressed their will to collaborate with us on several levels. On one hand, they were interested in helping two of their PhD students, Maarten Van de Put (UA), Condensed Matter Theory at IMEC, and Dries Sels (UA), Theory of Quantum Systems and Complex Systems by adopting the presented method in their PhD studies and by starting a Wigner MC community in Belgium. On the other hand, they were interested in utilizing the AComIn approach to a plethora of interesting physical situations and semiconductor simulations. A possible collaboration with experimentalists lead by Prof. Nadine Collaert in IMEC is in progress that could eventually lead the AComIn team to enabling comparisons of IICT's approach with the experimental data issued from measurements of quantum computing devices developed recently at IMEC (single dopant devices based on Silicon).

Prof. Lyubka Doukovska and **Dr. Vassia Atanassova** visited the Institute of Informatics at the Slovak Academy of Sciences (SAS) in the period 2-7 December 2013 in order to perform joint work with Prof. František Čapkovič. The main purpose of this visit was carrying out scientific discussions and preparation of two papers ("*Generalized Net Model of the Creditworthiness Financial Support Mechanism for the SMEs*" and "*Generalized Nets with Real Number Volumetric Tokens*") for publication in the SAS' journal "Computing and Informatics". The meetings and discussions held there were aimed at establishing future scientific cooperation in areas of joint research interest.

4 ATTENDING CONFERENCES, WORKSHOPS, EXHIBITIONS, AND INFORMATION EVENTS

This section presents the participation of IICT experienced researchers in scientific and information events. This is one of the major instruments for spreading out information about AComIn results to the academic community. Individual reports about these networking activities are stored in the Team Area of the AComIn site.

4.1   Participation in scientific events

Participations in different kinds of scientific events play important role in dissemination of new research results and establishment of contacts with colleagues working in the same field. We report here that during AComIn months 1-18, 32 experienced researchers participated in 33 international scientific events (31 of them peer-reviewed conferences and workshops, one European Exhibition with reviewed exhibits and one Lab Surfing Event of a FET-oriented project for Young researchers). In total, these researchers gave 63 presentations. As result, 54 peer reviewed papers were published in the respective event Proceedings. On exceptional basis, few IICT seniors took part in 3 peer-reviewed conferences and workshops without presentation of accepted paper, but with the aim to promote AComIn and present its results. In this section we overview all participations in scientific events that were implemented in WP3 by 31 March 2014. Please note that WP3 does not cover participation in events, organised by IICT with partial AComIn support (in WP5 "Dissemination"). Therefore this section enumerates only participation in events organised by external institutions and/or without any connection to AComIn.

We summarise all participations to scientific events and list the papers that were published in the respective Proceedings. The events are listed chronologically following the site order (Figure 4).

Prof. Emanouil Atanasov, 8-12 April 2013: *EGI Community Forum*, Manchester, UK.
Prof. Atanasov participated in the discussions of the various sessions and working groups and presented the aims of AComIn particularly regarding the processing of large quantities of sensor data that occur within this project. During the debates and discussions between the leading centres in the field of data grid and High Performance Computing (HPC) at regional and European level, he pointed out the IICT position as a leading research organisation in Bulgaria and presented the IICT vision for the organisation and financing of future work. Dr. Atanasov discussed with the representatives of the large computing centres from the UK, Sweden and Germany the possibilities for joint research.

    The presentations and demonstrations at the forum included impressive examples of excellent applications that use large amounts of data, for example from the National Grid Initiatives of Poland and the UK, where ongoing national projects have formed large communities of scientists who use the possibilities of Grid technologies for processing their research data. These experiences will be taken

Figure 4. Reports about all participations to scientific events in AComIn

into account for further improvement of the project Policy documents, so as to reinforce the importance of handling large volumes of data including those generated within AComIn, to increase the project impact on the Bulgarian scientific community as a whole and to open up new directions for collaboration.

Prof. Daniela Borissova and **Prof. Ivan Mustakerov**, 13-16 April 2013: *World Academy of Science, Engineering and Technology* (http://waset.org/) *International Conference on Computer Science and Applied Mathematics* (ICCSAM 2013), Venice, Italy.

Prof. Borissova and Prof. Mustakerov presented two papers accepted for publication in the conference proceedings: *An Algorithm for an Optimal Staffing Problem in Open Shop Environment*, and *A Discrete Choice Modeling Approach to Modular Systems Design* (see [1,2] in the List of WP3 Papers). The topics of the presentations at the conference covered different scientific fields of computer science and applied mathematics, thus creating conditions for fruitful participation in the discussions. Contacts were established with other scientists, to exchange ideas in the area of information technologies and optimisation. The discussions with other conference participants implied generation of further innovation ideas for different optimisation problems concerning optimal control in the area of computer science and applied mathematics. WASET proceedings are blind peer reviewed by three reviewers.

Prof. Emanouil Atanasov, 19-24 May 2013: *36th International Convention on Information & Communication Technology, Electronics & Microelectronics* (MIPRO 2013), Opatija, Croatia.

Prof. Atanasov presented new results achieved by his group in IICT in a talk titled "*Message Oriented Framework with Low Overhead for Efficient High-Performance Monte Carlo Simulations*". The paper was published in the Proceedings of the conference (see [3] in the List of WP3 Papers). As part of the conference Dr. Atanasov also participated in the presentation of research infrastructures of various types in Europe RIDE 2013 (Research and Education Infrastructure Dissemination Event). During the discussions it was apparent how the efforts in High Performance Computing become intertwined with those on the so-called Big Data. Prof. Atanasov recommends that IICT considers joining the efforts in the Research Data Alliance, where such topics are the main focus.

Prof. Aneta Karaivanova, 4-8 June 2013: *International Conference on Computational Science* (ICCS 2013), Barcelona, Spain.

ICCS is an annual conference that brings together researchers and scientists from Mathematics and Computer Science as principal computing disciplines, researchers from various application areas who are pioneering computational methods in sciences such as Physics, Chemistry, Life sciences, and Engineering, as well as in arts and humanitarian fields, to discuss problems and solutions in the area, to identify new issues, and to shape future directions for research. Average attendance each year amounts to about 350 participants. The theme for ICCS 2013 was "Computation at the Frontiers of Science", to mark the ever-increasing importance of and progress in computational science theory and practice at the frontiers of science. The conference is highly relevant to the objectives and priorities of project AComIn. During the conference Prof. Karaivanova gave a talk titled "*Monte Carlo Simulation of Ultrafast Carrier Transport: Scalability Study*". The corresponding full paper is included in the ICCS Proceedings, published by Elsevier in Procedia Computer Science ([4] in the List of WP3 Papers).

Prof. Lyubka Doukovska, 4-8 June 2013: *International Conference "Signal Processing Symposium"* (SPS-2013), Jachranka Village, Poland.

Prof. Doukovska, member of the AComIn core team, gave the following three talks at SPS-2013: *(i) Predictive Maintenance Model-Based Approach for Objects Exposed to Extremely High Temperatures*; *(ii) Network Flow Interpretation of Innovation Processes and Risks*; and *(iii) Design and Application of Artificial Neural Networks for Predicting the Values of Indexes on the Bulgarian Stock Market*.

SPS-213 is a prestigious IEEE event, a focal meeting in signal processing, with Proceedings of peer reviewed papers. The articles, presented by Prof. Doukovska, are given in the List of WP3 Papers, see [5, 6, 7]. During the conference she contacted colleagues from Universities and research centres, who also attended the event and discussed the possibility for future scientific collaboration.

Dr. Stanislav Stoykov, 11-15 June 2013: *4th International Conference on Computational Methods in Structural Dynamics and Earthquake Engineering* (COMPDYN 2013), at Kos Island, Greece.

At COMPDYN 2013 Dr Stoykov, an incoming experienced researcher employed as an AComIn post-doc, gave a talk presenting the paper: S. Stoykov, S. Margenov, *Nonlinear vibrations of rotating 3D tapered beam with arbitrary cross sections* (see [8] in the List of WP3 Papers). Dr Stoykov participated in various discussions on topics related with his work, thus increasing his knowledge on computational methods in nonlinear dynamics. He also met researchers who investigate in the same field and who were interested in his achievements. The participation in the conference helped to disseminate research results achieved within AComIn project.

Prof. Dimitar Karastoyanov, 16-20 June 2013: *EuroNanoForum*, Dublin, Ireland.

The forum was attended by more than 1000 participants (speakers and listeners) from more than 30 countries. The program included 10 plenary lectures, more than 30 oral presentations and more

than 200 poster presentations. The main objective of the forum was to present the current European projects and to support contacts between scientists in the field of nano-materials and nano-technology. Prof. Karastoyanov presented the idea "*Abrasive wear of nanostructured nickel coatings deposited on folio extrusion shafts*", a research result obtained within AComIn. He participated in discussions on the latest developments in the nano field and established contacts with foreign scientists - potential partners in future international projects. One of the meetings was with scientists from the Sabanci University - Istanbul, Turkey who have a laboratory similar to AComIn Smart Lab (high speed camera, thermo camera, 3D scanner, 3D printer, tomograph, special software, etc); they are interesting for future collaboration.

Prof. Vera Behar and **Prof. Ivan Garvanov**, 18-23 June 2013: *International Radar Symposium* (IRS'2013), Dresden, Germany.

This symposium is one of the most prestigious conferences where scientists and researchers from 33 countries discuss the latest ideas in the field of signal processing in radars, and their applications in various areas of civil life. Prof. Behar and Prof. Garvanov gave the following two talks that present articles published in the Proceedings of the conference: *(i) The Experimental Study of Possibility for Radar Target Detection in FSR Using L1-Based Non-Cooperative Transmitter* and *(ii) Simple Algorithms for Target Detection in FSR Using Local Statistics* (see papers [9], [10] in the List of WP3 Papers).

During this conference a series of meetings with young scientists and professors from the University of Birmingham (UK), Kiev (Ukraine) and Ryazan (Russia) was held. In particular, further prospects for continuing the cooperation with scientists from the University of Birmingham in the signal processing in Forward Scatter Radar were discussed. Together with the scientists from Ukraine, possibilities to motivate Ukrainian post-docs to work in AComIn in the area of signal processing, using the Smart Lab microphone arrays, were discussed.

Prof. Gennady Agre, Prof. Lyubka Doukovska, Prof. Petya Koprinkova – Hristova, Prof. Kiril Alexiev, Prof. Albena Tchamova, Dr. Yancho Todorov, Prof. Ivan Mustakerov and **Prof. Daniela Borissova**, 18-22 June 2013: *2013 IEEE International Symposium on Innovations in Intelligent Systems and Applications* (INISTA 2013), Albena, Bulgaria.

This symposium is an already established international IEEE event in the field of intelligent systems and their applications. For the first time INISTA was organised in Bulgaria by IICT-BAS and there were participants from 12 countries. The scientific topics of the INISTA symposium covered a large spectrum of the multidisciplinary fields of intelligent systems. The IICT seniors, who presented results achieved in the AComIn project, gave eight talks as follows, presenting papers that were published in the symposium's proceedings: *(i)* Gennady Agre: *On Applicability of Principal Component Analysis to Concept Learning from Images*; *(ii)* Lyubka Doukovska: *Working Regimes Classification for Predictive Maintenance of Mill Fan Systems*; *(iii)* Petia Koprinkova-Hristova: *Clustering of Spectral Images using Echo State Networks*; *(iv)* Kiril Alexiev: *An Algorithm for Error Reducing in IMU*, *(v)* Albena Tchamova: *Why Dempster's rule doesn't behave as Bayes rule with Informative Priors*, and *Tracking Applications with Fuzzy-Based Fusion Rules*, *(vi)* Yancho Todorov: *Fuzzy-Neural Predictive Control using Levenberg-Marquardt optimization approach*, *(vii)* Ivan Mustakerov: *An Intelligent Approach to Optimal Predictive Maintenance Strategy Defining*, and *(viii)* Daniela Borissova: *A Concept of Intelligent e-Maintenance Decision Making System* (papers [11–19] in the List of WP3 Papers).

The event brought together researchers from the entire spectrum of the multi-disciplinary fields of intelligent systems and established effective means of communication between them. During the symposium AComIn participants were able to discuss their work and possibilities for future common initiatives related to AComIn project.

Prof. Dimitar Karastoyanov, 23-28 June 2013: *International Symposium on Theoretical Electrical Engineering* (ISTET 2013), Pilsen, Czech Republic.

The ISTET 2013 was attended by over 200 participants (speakers and listeners) coming from more than 20 countries. The program included five plenary lectures, more than 20 oral presentations and 100 poster presentations. The main objective of the ISTET 2013 was to present the current research and results in the field of theoretical electrical engineering and to expand contacts between scientists in the field of electro magnetics, signal processing and applications. Prof. Karastoyanov's presentation was titled "*Influence of Different Geometric Parameters on the Static Force Characteristics of an Electromagnetic Actuator for Braille Screen*". The corresponding paper [20], published in the Event Proceedings, disseminates research results achieved within the AComIn project.

Prof. Galia Angelova, Prof. Dimo Dimov, Stanislav Dimitrov and **Dr. Tasho Tashev,** 28-30 June 2013: 14th *International Conference on Computer Systems and Technologies* (CompSysTech'13), Ruse, Bulgaria.

The main objective of the CompSysTech'13 event was to bring together academic scientists and researchers so as to exchange and share their experiences and research results. The following presentations were given: *(i)* Galia Angelova, plenary talk: *Automatic Information Extraction from Patient Records in Bulgarian Language*; *(ii)* Dimo Dimov: *Emotion recognition by face dynamics*; *(iii)* Stanislav Dimitrov: *Loading test of Apache HTTP server by video file and usage measurements of the hardware components* and *(iv)* Tasho Tashev: *A Computer Modelling of the Throughput of a Crossbar Switch by PI-Patterns for Uniform Traffic with Variable Intensity* (see papers [21–24] in the List of WP3 Papers).

All talks present results of research activities within the AComIn project. As a whole CompSysTech'13 was a useful event contributing to the main ICT topics of project AComIn and allowing for exchange of knowledge and experience between national and foreign scientists in the field of computer systems and information technologies.

Prof. Ivan Mustakerov, 7-10 July 2013: *World Academy of Science, Engineering and Technology, International Conference on Modelling, Optimisation and Simulation* (ICMOS 2013), Prague, Czech Republic.

The papers in the internationally refereed Conference Proceedings were blind peer reviewed by three reviewers. The post conference proceeding is indexed in International Science Index, CiteSeerX, Google Scholar, EBSCO, ERA. At ICMOS 2013 Prof. Mustakerov gave the talk *Data structures and algorithms of intelligent Web-based system for modular design* that presents a paper published in the Conference proceedings (see [25] in the List of WP3 Papers). It disseminates results in Optimisation achieved within the AComIn project: data structures and algorithms of intelligent Web-based system for modular design taking into account modules compatibility relationship and given design requirements. The system intelligence is realised by developed algorithms for choice of modules reflecting all system restrictions and requirements. The proposed data structure and algorithms are illustrated by case study of personal computer configuration.

Prof. Daniela Borissova, 7-10 July 2013: *World Academy of Science, Engineering and Technology, International Conference on Defence Systems Engineering (ICDSE 2013)*, Prague, Czech Republic.

In the conference Prof. Borissova presented results in the field of design and assessment of night vision devices via a web-based approach. She gave the talk: *Web-based architecture of a system for design assessment of night vision devices* (paper [26] in the List of WP3 Papers). The system is used for assessment before producing of night vision devices. The proposed architecture is based on the application of a mathematical model for designing of night vision devices. An algorithm with two components – for iterative design and for intelligent design is developed and integrated into system

architecture. The iterative component suggests compatible modules combinations to choose from. The intelligent component provides compatible combinations of modules satisfying given user requirements to device parameters. The proposed web-based architecture of a system for design assessment of night vision devices is tested via a prototype of the system. The testing showed the applicability of both iterative and intelligent components of algorithm. This result is connected with the Certificates of industrial design, presented in Deliverable D4.2, Section 3.

Prof. Lyubka Doukovska, Prof. Vladimir Monov and **Dr Boris Staykov**, 7-11 July 2013: *Third International Symposium on Business Modelling and Software Design* (BMSD-2013), Noordwijkerhout, the Netherlands.

The programme of BMSD-2013 included an opening session, six full papers sessions, five short papers sessions, four special sessions and a discussion panel. Prof. Doukovska, Prof. Monov and Dr Staykov gave four talks: The titles of these talks are as follows: *(i) Innovation Cycles Control through Markov Decision Processes*; *(ii) Generalized Net Model of the Methodology for Analysis of the Creditworthiness and Evaluation of Credit Risk in SMEs Financing*; *(iii) Forecasting Price Movement of Sofix Index on the Bulgarian Stock Exchange–Sofia Using an Artificial Neural Network Model*; *(iv) The role of ERP Systems in Modern Business and Corporate Management*. These papers present results achieved in AComIn project, in the area of Optimisation and Intelligent Control (papers [27-30] in the List of WP3 Papers).

Prof. Vera Behar, **Prof. Ivan Garvanov** and **Dr. Dorina Kabakchieva**, 8-13 July 2013: *Second International Conference on Telecommunications and Remote Sensing* (ICTRS-2013), Noordwijk, The Netherlands.

Prof. Behar, Prof. Garvanov and Dr. Kabakchieva gave three talks: *(i) Sound source localization in a security system using a microphone array*; *(ii) Sound parameter estimation in a security system* and *(iii) FSR Marine Target Classification With Data Mining Approach* on papers which are published in the Proceedings of the conference (see [31-33] in the List of WP3 Papers). These papers present elaborated methods for signal processing that are oriented to equipment for noise source identification which is expected for purchase in the Smart Lab of the AcomIn project. Especially the first paper develops, using commercial microphone arrays, a computational algorithm according to the adaptive Minimum Variance Distortionless Response (MVDR) beamforming method in order to estimate DOA of sound signals coming from sensors or other sound sources.

Prof. Stefka Fidanova and **Dr Jean Michel Sellier**, 14–20 July 2013: *9th IMACS Seminar on Monte Carlo Methods*, Annecy, France.

IMACS is the International Association for Mathematics and Computers in Simulation. The seminar is a biennial event which considers in depth issues related to High Performance Computing, Advanced Computing and Emerging Technologies. The 9th Seminar attracted 45 participants from all over the world. Dr. Fidanova gave a talk titled "*Algorithm Parameters Sensitivity of Monte Carlo Algorithm for E.coli Cultivation Process Modelling*". She carried out useful discussions in her field of interest in compliance with the AComIn Project tasks. Dr. Sellier, one of the post-docs in AComIn, gave a talk "*A benchmark study of the Wigner Monte–Carlo method*" where he presented some results obtained in IICT while working in the project. After the reviewing of papers, the post-event Proceedings will be published in a regular journal: *Mathematics and Computers in Simulation* or *Monte Carlo Methods and Applications*.

Prof. Petia Osenova, 28 July – 3 August 2013: *9th Annual Meeting of the Deep Grammars (DELPH-IN)*, Sankt Wendel, Germany.

Prof. Osenova, an AComIn team member in the area of "Language Technologies", presented an update of the new additions to Bulgarian BURGER grammar and activities within BulTreeBank group. Apart from the discussions, related to the talks in the programme, she participated in some discussions related to the new EU project on Deep Grammars for High Quality Translation (QTLeap), starting on 1st November 2013. The visit of Dr. Osenova is important for the further development of Bulgarian Deep Grammar in accordance to other languages grammars. In this respect, IICT experts are in touch with the state-of-the-art groups in Europe and USA. The results, presented in the talk of Prof. Osenova, will be published in the post-conference *DELPH-IN* Proceedings (see [34] in the List of WP3 Papers).

Prof. Galia Angelova and ***Dr. Irina Temnikova***, 8-9 August 2013: *International Biomedical Natural Language Processing* (BioNLP) Workshop associated to the *World Association of Computational Linguistics (ACL) 2013 Annual Conference* in Sofia, Bulgaria.

The BioNLP workshops are held regularly and this is their 12th edition. Dr Irina Temnikova attended the event as AComIn post-doc, reporting results achieved in the project. She presented an accepted paper, titled "*Recognising sublanguages in scientific journal articles through closure properties*" on sublanguage recognition as a test before applying this method to recognising sublanguages in patent documents. The participation in this event is assessed as extremely useful as it allowed testing how well the method under development within the AComIn project recognises sublanguages, before it could be applied to patents, where the existence of sublanguages is questionable. The respective paper is published in the Workshop Proceedings (article [35] in the List of WP3 Papers). Prof. Angelova had an invited talk "*Processing clinical texts in a less-resourced language: the challenge to start with Bulgarian*". Her presentation is uploaded in the Team Area of the AComIn site, under *Reports*, *WP3*, *Participation in scientific events*.

Prof. Dimitar Karastoyanov and ***Prof. Vladimir Monov***, 15-16 August 2013: *International Conference on Modelling, Identification and Control Engineering* (ICMICE 2013), Venice, Italy.

The ICMICE 2013 was attended by more than 150 participants from more than 15 countries. The main objective of the ICMICE 2013 was to bring together leading academic scientists, researchers and scholars in order to exchange and share their experiences and research results, as well as to discuss the practical challenges encountered and the solutions adopted. Prof. Karastoyanov and Prof. Monov gave two talks: *(i) An Advanced Technology for Renovation of Extruding Shafts* and *(ii) An Intelligent System for Knee and Ankle Rehabilitation* (see [36,37] in the List of WP3 Papers). Both papers presented results obtained within the AComIn project. Prof. Karastoyanov and Dr. Monov participated in discussions about the latest developments in the technology of renovation of extruding shafts including the most advanced methods of laying nanocomposite coatings on the shaft's surface.

Dr. Jean Michel Sellier, 2-6 September 2013: *International Conference on Simulation of Semiconductor Processes and Devices* (SISPAD 2013), Glasgow, UK.

The conference SISPAD 2013 is the leading forum for Technology Computer-Aided Design (TCAD). It provided an open forum for presenting the latest results and trends in process and device simulation. Dr Sellier, an AComIn post-docs, presented results achieved in the project, giving the talks: *Two dimensional transient Wigner particle model* and *Quantum insights in gate oxide charge–trapping dynamics in nanoscale MOSFETS*. The papers ([38,39] in the List of WP3 Papers), published in the SISPAD proceedings, show how elastic processes can trigger decoherence as soon as they include some level of randomness in their implementation. The Wigner Monte Carlo method was applied to

explain the dynamics of an electron in a MOSFET channel in proximity of traps and scattering centers. These presentations at SISPAD 2013 attracted much attention and interest.

***Prof. Stefka Fidanova**, 6–12 September 2013: IEEE Federated Conference on Computer Science and Information Systems*, Krakow, Poland.

The conference consisted of 25 mini-symposiums. Prof. Fidanova participated in the Workshop on Combinatorial Optimisation (WCO). She presented some results, achieved within AComIn project, in her talk entitled "*Influence of the population size on genetic algorithm performance in case of cultivation process modelling*". It was devoted to the investigation of the influence of the population size on the genetic algorithm (GA) performance for a model parameter identification problem. This study is important for human health. The paper is published in the conference Proceedings, see [40] in the List of WP3 Papers. During the conference Dr. Fidanova participated in various interesting discussions which she reported were very useful for her future work in this field.

***Prof. Dimitar Karastoyanov**, 7-13 September 2013: the 5th World Tribology Congress* (WTC 2013), Torin, Italy.

WTC is the most representative scientific event in the area. Particular attention was devoted to the importance of Tribology for the environment. The 5th WTC's highlight was how Tribology fundamentals and applied studies can supply an essential support to minimise the environmental impact. It was attended by over 2000 participants from over 25 countries. The program included 14 Tracks (Sessions) as well as more than 1500 oral and poster presentations. Prof. Karastoyanov's gave two talks titled "*Friction and Wear of Ni Coatings with Nanosize Particles of SiC*" and "*Composite Coatings to Improve Durability of the Working Body of the Drill*" where he presented research results achieved within AComIn project. The papers were published in the conference Proceedings, see [41-42] in the List of WP3 Papers.

***Prof. Dimo Dimov**, 8-14 September 2013: 17th International Conference on Image Analysis and Processing* (ICIAP) and the related event *2nd International Workshop on Pattern Recognition in Proteomics, Structural Biology and Bioinformatics* (PRPSBB'2013), Naples, Italy.

The event ICIAP is endorsed by the International Association for Pattern Recognition (IAPR), by IEEE Technical Committee PAMI and by IEEE Computational Intelligence Society. Prof. Dimov gave a talk titled "*Structural Blocks Retrieval in Macromolecules: Saliency and Precision Aspects*" presenting research work done in the framework of AComIn project. This is a joint work with Prof. Virginio Cantoni from the University of Pavia, an AComIn partner, and presents results achieved during the secondment of Prof. Dimov to Pavia and the short visits of Prof. Cantoni to Sofia (see [43] in the List of WP3 Papers).

***Prof. Petia Koprinkova-Hristova** and **Dr Yancho Todorov**, 10-13 September 2013: 23rd International Conference on Artificial Neural Networks (ICANN)*, Technical University of Sofia, Bulgaria.

The International Conference on Artificial Neural Networks (ICANN) is the annual flagship conference of the European Neural Network Society. The ideal of ICANN is to bring together researchers from two worlds: information sciences and neurosciences. The scope is wide, ranging from machine learning algorithms to models of real nervous systems. The aim is to facilitate discussions and interactions in the effort towards developing more intelligent artificial systems. Prof. Koprinkova-Hristova presented results achieved recently in AComIn project: "*Echo State Networks in Dynamic Data Clustering*". Dr. Todorov presented his research work in AComIn giving the talk "*Recurrent Fuzzy-Neural Network with Fast Learning Algorithm for Predictive Control*". The papers (see [44-45] in the List of WP3 Papers) were published in a volume of Springer's Lecture Notes in Computer Sciences.

Prof. Todor Stoilov, 15-18 September 2013: *1st IFAC Workshop on Advances in Control and Automation Theory for Transportation Applications* (ACATTA 2013), Istanbul, Turkey.

The main aim of this scientific event was to bring together researchers and practitioners to discuss control and automation theory for transportation, and safety systems from the perspective of research and practice. Particularly, developments in control theory and applications in railway systems were addressed. Prof. Stoilov, Chair of IFAC TC7.4 "Transportation Systems", participated in ACATTA 2013 as one of the Chairs of the International Programme Committee. He gave the talk "*Traffic Lights Optimisation with Measurements of Noise Levels*" presenting AComIn results in the area of Optimisation and Intelligent Control. The paper (see [46] in the List of WP3 Papers) was published in a volume of the journal "Control and Automation Theory for Transportation Applications".

Dr. Clemens Hofreither, 16-20 September 2013: *22nd International Conference on Domain Decomposition (DD) Methods*, Università della Svizzera italiana - Lugano, Switzerland.

The conference is a top international event organised annually by the Scientific Committee for the International Domain Decomposition Conferences consisting of at most 15 distinguished scientists in the area. More than 170 participants attended the 22nd DD Conference. The talk of Dr. Hofreither, entitled "*On full multigrid schemes for isogeometric analysis*" presents results in the hot topic of solvers of optimal complexity in isogeometric analysis. The paper will appear in the conference proceedings in 2014. Dr. Hofreither was also a co-author of the talk "*Isogeometric analysis with GISMO: some results and implementations*" (together with B. Jüttler, U. Langer, A. Mantzaflaris, S. E. Moore, S. Tomar, and W. Zulehner).

Prof. Todor Stoilov, 25–28 September 2013: *9th International Conference on Applied Mathematics (ICAM 9)*, Baia Mare, Romania.

ICAM 9 was organised by the Department of Mathematics and Computer Science, North University Center at Baia Mare, Technical University of Cluj-Napoca, Romania. This is the 9th edition of the event that takes place since 1996. It brought together researchers working in the areas of Mathematics and Computer Science. The Conference is internationally recognised and was attended by participants from Moldova, Hungary, Check Republic, Italy, USA, Russia, Austria. Prof. Stoilov was invited to attend the event by Prof. Petrica Pop who visited IICT in March 2013. Prof. Stoilov gave a talk titled "*Bi-level definition of portfolio optimisation problem*", co-authored with K. Stoilova. The paper was published in the pre-Proceedings of the Conference ([47] in the List of WP3 Papers).

Prof. Kiril Alexiev, 9-13 October 2013: *Third International Conference on Modelling and Development of Intelligent Systems* (MDIS 2013)*, Sibiu, Romania.

The aim of the conference was to bring together computer scientists, mathematicians, researchers and students working in fields which can be connected with modelling and development of intelligent systems. Prof. Alexiev gave a talk entitled "*Inertial Measurement Unit Simulator*" and took part in discussions with international colleagues including young researchers. He disseminated information about AcomIn, the signal processing activities in the project and the plans to develop applications using the acoustic holography of Smart Lab. He also promoted the open post-doc positions of AcomIn. The respective paper will be published in the Conference Proceeding with ISSN and ISBN, printed by Lucian Blaga University Press ([48] in the List of WP3 Papers).

Prof. Lyubka Doukovska, 11-12 October 2013: *International Workshop on Intuitionistic Fuzzy Sets and Generalized Nets* (IWIFSN 2013), Warsaw, Poland.

The purpose of the workshop is to present recent developments and trends in intuitionistic fuzzy sets and other generalisations of fuzzy sets, and of so-called generalised nets which can be viewed as a generalisation of Petri nets. In this event Prof. Doukovska gave two talks entitled "*Generalized Net

Model of Internal Structural Unit Functionality Focused on SME Financing" and "A*ssessment Finance Approach from the Glase of a Generalized Net Model implemented in a Structural Unit of a Financial Institution*". The papers consider recent AComIn results in Optimisation and Control, using fuzzy sets. These papers will be published in the event proceedings in 2014 ([49,50] in the WP3 List of Papers).

Prof. Daniela Borissova and **Prof. Ivan Mustakerov,** 13-16 October 2013: *International Conference on Ecomonics and Mathematical Engineering* (ICME 2013) organised by the *World Academy of Science, Engineering and Technology* (http://waset.org/), Barcelona, Spain.

They presented research results related to the AComIn project in two talks: *K-best Night Vision Devices by Multi-Criteria Mixed-Integer Optimisation Modelling* and *Investments Attractiveness via Combinatorial Optimisation Ranking.* The first paper describes an approach to ranking a set of countries taking into account an investor point of view about importance of different economic indicators. A ranking algorithm is proposed based on combinatorial optimisation modeling and repeated multicriteria tasks solution. The final result is list of countries ranked in respect of investor preferences. The second paper is based on multi-criteria mixed-integer optimisation modeling for defining of k-best night vision devices. Two papers were published in the conference Proceedings based on these two talks ([51,52] in the WP3 List of Papers).

Prof. Daniela Borissova and **Prof. Ivan Mustakerov**, 21-25 March 2014: *4th International Conference on Information Systems and Technologies* (ICIST 2014), Valencia, Spain.

The ICIST 2014 aims to provide a forum for researchers, educators, government officers, consultants, private sectors, managers, developers and others in the rapidly growing field of information systems and technologies to meet, discuss and exchange ideas on recent advances. The research conducted by prof. Borissova and Dr. Mustakerov in the framework of the AComIn project was presented in their two talks titled "*A Web Application for Group Decision-Making based on Combinatorial Optimization*" and "*Web-based Tool for Preliminary Assessment of Wind Power Plant Design*". The first paper describes web application for group decision-making. It uses multi-attribute decision making approach based on combinatorial optimisation. The approach and the Web-based framework are tested on the basis of real data example. The second paper proposes a Web-based tool for preliminary assessment of wind power plant design project, based on original algorithm with two branches ("iterative" and "intelligent"). Two papers were published in the conference Proceedings (see [53-54] in the List of WP3 Papers).

Prof. Galia Angelova and **Prof. Dimitar Tcharaktchiev**, 19-20 March 2013: *Exhibition at the European Data Forum* (EDF 2014), Athens, Greece.

EDF is an annual event held after 2012. It is the venue where researchers and practitioners in Big Data meet with the participants of the EC-funded projects in the area, and a forum where the European Commission announces future H2020 calls related to the Big Data topic. The Conference gathered 600 attendees. The collocated Exhibition contained 26 Exhibits accepted after reviewing. Prof. Angelova and Prof. Tcharaktchiev presented the only exhibit (poster and demo) from Eastern Europe entitled: "*Applying Language Technologies and Data Mining on Healthcare Records for Better Treatment of Bulgarian Diabetic Patients*". It discusses automatic construction of Bulgarian Diabetic Register. The data volume was one of the most attractive features of the exhibit as well as the fact that the team applies large-scale language technologies to identify entities of interest in the free text of clinical narratives. The result is achieved with the partial support of AComIn Project within the topic "Language and semantic technologies", esp. Intelligent Management of Digital Content. The Posters are uploaded in the Team Area of AComIn site.

Prof. Ivan Dimov, ***Dr. Jean Michel Sellier***, ***Dr. Stanislav Stoykov***, ***Dr. Vladimir Kotev***, ***Dr. Vassia Atanasova***, ***Dr. Yancho Todorov*** and **Ivelina Nikolova**, 25-26 March 2013: *EYE Lab Surfing Event*, Thessaloniki, Greece.

EYE (Empowering Young Exploreres) is a Support Action that started in late 2013 in FET FP7. It is aimed at assisting young researchers to realise their potential in writing FET (Future and Emerging Technologies) projects and to accomplish new scientific achievements. For this purpose, EYE organises cycles of events: regional Lab Surfing Workshops (LSE) for presentation of innovative ideas, Scientific Incubators and Blue Sky Conferences. Since AComIn is strongly related to breakthroughs and innovation, several AComIn seniors and post-docs were able to submit novel ideas that are worth to be selected for presentation at a EYE Lab Surfing Event. Prof. Ivan Dimov was invited as a Chair of the Scientific Committee of the LSE Event. Dr Jean Michel Sellier, a post-doc employed in AComIn, was one of the invited speakers and gave a keynote talk: "*Advanced Quantum Simulations for Next-Generation Nanoelectronic Devices*". Dr Stanislav Stoykov, a post-doc employed in AComIn, presented the project proposal "*Bifurcation Analysis of Rotating Blades by Large-scale Models".* Dr. Vladimir Kotev, another post-doc employed in AComIn, proposed the idea "*Dynamics and Control of Micro-Nano robot for Medical Application".* The Young Explorers of IICT proposed further *Multicriteria decision making aimed at reducing cost-unfavourable criteria, using index matrices and intuitionistic fuzzy evaluations* by Dr. Vassia Atanassova and *Advanced Control of the Lyophilization Process* by Dr. Yancho Todorov. Ivelina Nikolova, who completed her PhD study and expects thesis defense, presented the project *Large Scale Resolution of Relative Temporal References.* Jointly with other young researchers, the above-listed IICT young explorers can submit now their project proposals to the European Blue Sky conference. The presentations are uploaded at the AComIn site in the Team Area, under *Reports / WP3.*

List of WP3 Papers

Papers published as result of participation in scientific events

1. Borissova, D., I. Mustakerov, *An algorithm for an optimal staffing problem in open shop environment.* World Academy of Science, Engineering and Technology, pISSN 2010-376X, eISSN 2010-3778, Vol. 76, 2013, pp. 46-50. Available online at:
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55. K. Georgiev, N. Kosturski, Y. Vutov, *On the Adaptive Time-Stepping in Radio-Frequency Liver Ablation Simulation: Some Preliminary Results*, to appear in LNCS 8353 (2014), ISSN 0302-9743 **SJR 0.332**

56. N. Kosturski, S. Margenov, Y. Vutov, *Calibration of Parameters for Radio-Frequency Ablation Simulation*, to appear in LNCS 8353 (2014), ISSN 0302-9743 **SJR 0.332**

4.2   Participations in information events

Attending information events in the EU is considered by the AComIn team as an extremely important activity as it enables the IICT seniors to establish new useful contacts, to build new consortia, to consolidate already existing working contacts and – last but not least – to promote AComIn and its achievements. Information events in 2013 were especially important since Horizon 2020 was launched at such an event. Eleven visits of IICT experienced researchers to eight events have been implemented. The Reports are uploaded in the AComIn Team Area, under *Reports*, *WP3*, *Participation in Information Events* (see Fig. 5).

Figure 5. Reports about participation in Information events

Prof. Aneta Karaivanova, 2-6 December 2012: *e-IRG Workshop on Data Issues and e-IRD delegate meeting*, Amsterdam, The Netherlands.

The e-Infrastructure Reflection Group (e-IRG) is an inter-governmental policy body that was founded with the aim to support the shared use of distributed electronic resources across Europe. The e-IRG comprises National Delegates from more than 30 European countries and 2 delegates from the EC/DG Information Society. The main objective of the e-IRG is to support the creation of a political, technological and administrative framework to pave the way towards a general-purpose European e-Infrastructure. The main outputs of the e-IRG are white papers, surveys, roadmaps and recommendations and analyses the future foundations of the European Knowledge Society. Many e-IRG's objectives are highly relevant to the AComIn project and to IICT-BAS's mission. Prof. Karaivanova took part in the e-IRG workshop and e-IRG delegate meeting as the Bulgarian representative in e-IRG group. The main topics of the workshop and the meeting included DATA issues. Prof. Karaivanova presented AComIn and its objectives to the e-IRG delegates.

Prof. Kiril Alexiev and ***Assist. Prof. Violeta Bogdanova***, 3–5 May 2013: *Joint Research Centre Ispra Open Day*, Ispra, Italy.

The IICT seniors visited JRC and participated in the Doors Open day, dedicated to science exploration, and obtained information on how the European Commission's in-house science service

helps to promote growth, jobs and innovation, a healthy and safe environment, consumer protection and secure energy supplies. More than 10 300 visitors were registered for this Open Day in Ispra. Prof. Alexiev and assist. prof. Bogdanova were particularly interested in presentations about sophisticated diagnostics using signal processing, sensor-related applications, radars in civil society etc. They promoted AComIn and disseminated information about its objectives, in particular those related to acoustic holography and eye tracking.

Prof. Galia Angelova, 24–25 June 2013: *A Research Potential capitalisation exercise: Thematic workshop on capacity building – Stairway to excellence*, Brussels, Belgium.
This one-day event was organised by the European Commission for the coordinators of all REGPOT-1 projects. The main aim was to facilitate building of research community among projects through the exchange of good practices on capacity building. Coordinators were invited to present their experiences as a case study. They also shared their experiences on how they used FP7 grants and Structural Funds at the same time. This was a very useful meeting esp. in June 2013, when AComIn was only in its month 9th. The presented success stories are useful information that can be adapted to the Bulgarian environment and AComIn implementation.

Prof. Dimitar Karastoyanov, 5-9 November 2013: *ICT 2013 Event Create, Connect, Grow*, Vilnius, Lithuania.
ICT 2013 was the launching event of ICT in Horizon 2020. The forum was attended by more than 5000 participants - speakers and listeners from more than 30 countries. The program included more than 30 plenary lectures, 100 oral presentations and 200 presentations of EC Projects including exhibition stands. The main objective of the forum was to present the H2020 programs in depth. Presentations oriented to specific Calls were particularly useful. Prof. Karastoyanov took part in sessions and discussions dealing with Robotics, Healthcare, Nanoscale Materials, and Energy Efficiency.

Dr Jean Michel Seller, 19-21 January 2014: *Excellent Science, FET Proactive and Flagship Information Day*, Brussels, Belgium.
Dr Sellier participated in the Information Day on 20 January 2014 where the H2020 FET Proactive Call related to Quantum simulations was presented. It turned out that this call deals with actual development of real physical devices that exploit quantum phenomena, such as superposition and entanglement of quantum states. The proposals submitted to this initiative should address research and development of digital or analogue quantum simulations, aimed at solving predefined real-world problems. On the impact side, the proposals should contribute to building up the core competencies for exploitation of quantum science and technologies in mainstream engineering. The conclusion is that the FET Open scheme is more relevant to the project proposal that is discussed between IICT, the AComIn partner University of Glasgow and the Belgium group in Antwerp.

Dimitar Ivanov, 3-5 February 2014: *Workshop "European GNSS Applications in Horizon 2020"*, Prague, Check Republic.
The aim of the workshop was to inform potential applicants on how to prepare proposals for the H2020-Galileo-GSA-2014-2015 call. Global Navigation Satellite Systems (GNSS) such as Galileo allow users worldwide to pinpoint their locations or the locations of other people or objects at any given moment. The program Galileo will increase the levels of accuracy and reliability, making possible a new range of more beneficial and commercially profitable products and services. The Workshop presentations considered sub-domains with specific GNSS requirements (rail, aviation, road etc.), proposal submission, financial rules etc. This information is very helpful for proposal preparation especially in programmes where IICT lacks experience.

Prof. Lybka Doukovska, Prof. Vladimir Monov and **_Dr. Yancho Todorov_**, 26-28 February 2014: _Official Opening of a new Centre for Robotics and Automation_, Plovdiv Branch of the Technical University – Sofia, Bulgaria.

This event enabled the exchange of experience and strengthening the collaboration and professional relationship with colleagues and scientists in the area of robotics and automation. A demonstration of robotic manipulators and complex mechanical and electronic devices was also presented. The experienced IICT researchers discussed and prepared a contract for collaboration and joint research work between the Institute of Information and Communication Technologies, Bulgarian Academy of Sciences and the Plovdiv Branch of the Technical University-Sofia. They also promoted the AComIn and disseminated project leaflets and bulletins.

Prof. Kiril Simov, 20-21 March 2014: _Linked Data for Language Technology Group Kick-Off and Roadmap Meeting_, collocated event to the European Data Forum 2014, Athens, Greece.

Linked Data (LD) has proven beneficial in many new and unforeseen ways for Language Technology (LT) and the newly gained interoperability and availability of LT data and services is currently receiving industry adoption. LD4LT Group is W3C group which is developing use cases to explore the industrial relevance of linguistic linked data in different industrial and governmental applications. The meeting aimed at bringing together stakeholders involved in the linguistic data value chain in order to explore new use cases and business models for reusing existing and future language (open or licensed) linked data resources and platforms for the joint development and hosting of multi–language data sets and services in different types of applications such as content analytics, machine translation, sentiment analysis, term disambiguation, etc. The Workshop offered several talks around the topics of Linguistic resources available in the linked data format and their potential impact on research and industry.

Prof. Simov was actively involved in the final roadmap discussion on important use cases that are feasible in near future in the area of Language Resources and Technologies and which are related to Linked Open Data (LOD). The attendance to the Workshop was important for IICT due to the chance to become a member of the group and establish new contacts within the area of LOD for language technology.

5 ADDED VALUE OF AComIn NETWORKING TO THE STRENGTHENING OF THE IICT RESEARCH AND INNOVATION CAPACITY

In the AComIn Technical Annex (Part B, p. 10), the project performance is assessed in terms of:
- *(i)   Research productivity*,
- *(ii)   Relevance to the socio-economic needs*,
- *(iii) Human Resources*,
- *(iv)   Innovation impact*,
- *(v)   Social impact.*

The activities of WP3 contribute mainly to the following indicators:

- *Research productivity* – because WP3 supports networking and provides opportunities for joint work with the international partners as well as funding for attendance in scientific events;
- *Human resources* – because WP3 contributes to the increase of "participation in scientific events abroad" and enables increase of the number of foreign researchers who visit the institute;
- *Innovation impact* – because WP3 supports invitations of foreign lecturers for organisation of higher quality Technology Transfer Events,
- *Social impact* – because WP3 supports invitations of visiting scholars who attend the Information Days and the Doors Open days. They give lectures that attract event larger number of participants to the AComIn Information events.

All AComIn work packages contribute to the Added Value of the project to the IICT Research and Innovation capacity. The Added Value of the packages will be summed up in D7.4 "*Input to the EC review*". Here we only list the project achievements enabled by WP3 activities:

Papers published as result of WP3 activities: 54 after attendance in Conferences;
                                             2 prepared as joint work in Secondments

Seminar lectures delivered in IICT or abroad: 22 while implementing short visits;
                                               6 during secondments;
                                              64 delivered by IICT experienced researchers at conferences and workshops attended via WP3

Visiting foreign scientists: 24, including 3 candidates for AComIn Post-doc positions

Visiting lecturers for TT Workshops: 1, for a TT event with a duration of several days

Attendances to conferences and workshops: 32 experienced researchers participated in 33 international scientific events

Attendances in Information events that enable participation in Consultative Bodies or H2020 programmes: 5

Participations to a JRC Event (Open Day) :   2

6 DEVIATIONS FROM SCHEDULE AND CONTINGENCY PLAN

AComIn started active networking with some delay because little research results and achievements were available for reporting and exchange at the very beginning. For instance, the first results were reported at a conference abroad in month 7 (April 2013).

Another reason for the delay is the lack of the AComIn equipment which appeared in months 12-15 (but the last two items are still missing). The delay in purchasing the Smart Lab devices implies delay of the research tasks that depend on the equipment; therefore the networking will speed up and become more active in the second project period.

The delayed implementation of Secondments is caused by the overload of the highly skilled partners, who need several months (if not years) to plan visits of guests to their premises. The experienced IICT researchers also need some time to prepare detachments from their duties that often include lecturing. Due to all these reasons, most secondments will be implemented in the second project period. A detailed contingency plan is given in the Periodic Progress Report for month 18.

7 CONCLUSIONS

The activities carried out within WP3 serve one of AComIn's main objectives - to strengthen the IICT research and innovation capacity by increasing the knowledge and skills of the experienced IICT researchers. Serious progress has been achieved in project months 1-18.

In the first place this includes the excellent relationships with all partnering organisations who are willing to provide help and support, and do their best to deepen the joint research activities with the respective IICT teams. The remote contacts of the leading IICT specialists with their colleagues abroad have been deepened. As a result new contacts were established and the foundations for future collaborations have been laid.

IICT researchers have new opportunities to participate in prestigious high ranking international scientific events (conferences, workshops, etc.), information days, and exhibitions. It becomes possible to discuss top level problems not only at national but at European and even world level, together with leading specialists in the corresponding areas. This is particularly important for the post-doctoral researchers, including the ones employed within AComIn, who are challenged to achieve better results to be presented at most prestigious scientific events.

The short two-way visits, implemented within WP3, promoted the transfer of know-how and best practices, including coordination of joint RTD activities, writing joint scientific publications, monographs and training materials, giving invited lectures, supervision of PhD students. Some colleagues from abroad have been delivering short courses on how to use the Smart Lab devices that had been already bought. In this way WP3 contributed also to the innovation activities in AComIn.