Network: CIII-HU-0019-11-1516

Program description:

Same as the uploaded PDF The CEEPUS network HU-0019 (formerly called H-81) has been running successfully for over 16 years: based on results and a reliable background for managing the mobility programme we intend to continue this cooperation in the following years. Our CEEPUS network H-81 (Hungarian coordination) won the CEEPUS Ministers' Prize of Excellence in 2004 and 2007. The network coordinator presented the results of the network at the annual meetings of the Danube Rector's Conference in Belgrad, November 2014 (Associate Node of European Institute of Innovation and Technology ICT Labs), in Graz, June 2010 and in Cluj, Nov. 2010. (Zoltán Horváth: Cooperation in Computer Science - a CEEPUS network, Danube Rector's Conference: University of Excellence, 5 Nov., 2010.) http://conference.ubbcluj.ro/drc_excellence/files/brochureExcellence2010.pdf Vikória Zsók presented our Ceepus collaboration at the OEAD conference in Vienna, in July 2013. The titel of her presentation was: „Erasmus Intensive Programm: Central European Functional Programming School". We have a private webpage about the used CEEPUS quota and about all planned and completed visits, including the results of courses given by the visiting lecturers and in 2015 we plan to develop a more detailled webpage, in order the students and colleagues from the 15 participating institutes can get more information. We hope to increase the amount of the application, and reach the most talented students. The communication between the coordinator and the partners is very efficient. Besides occasional bilateral meetings, the participants often exchange information via e-mail. All partners do their best in realizing student and teacher exchanges. During the application period the coordinators frequently collect information from the partners regarding the number of applicants and the number of unused quota. The host institutions arrange accommodation for the incoming students and teachers. In case of student exchanges the contact person from the host institution and that of the receiving institution discuss the study plan of the students. All participating institutions recognize the credits obtained by their students at the host institutions (every university applies ECTS). By this we assure the credit transfers of student mobilities. Information on the credit systems of the partners can be found on the home pages of the participating institutions. Additional value and new initiatives for 2015/2016 Since the academic year 2013/2014 our network run successfully with 13 partners (Department of Programming Languages and Compilers at Eötvös Loránd University (ELTE); Department of Computer Science, JKU, Austria; Department of Computer Science, University of Szeged, Hungary; Department of Computer Science, Babes-Bolyai University of Cluj-Napoca; Paisii Hilendarski University of Plovdiv; Constantine the Philosopher University (Nitra, Slovakia), Technical University of Košice, Subotica Tech (former Technical College), University of Novi Sad, János Selye University, University of Maribor, University of Ljubljana, and Sapientia Hungarian University of Transylvania), and there are many universities, who would be interested in joining to our prosperous network. We also would like to add new areas, to facilitate knowledge transfer among the partners. The new partners from 2015/2016 would be the Palacky University Olomouc, Czech Republic and St Kliment Ohridski University, Bitola, Macedonia. Their contribution to the network would be iconic programming, programming of control systems and robots, distance education methodology and application of e-learning in technology education (Palacky University) and Software Engineering, Semantic Web technologies, Next Generation Networks and Performance evaluation. Planned exchange actions The aim of this application is to provide funding for continuation and even for raising the level and the intensity of educational co-operation between the involved institutions.

However the publication of the results of these collaborations is also very important. In case of a successful application for the academic year 2015/2016 we would provide the possibility for the best graduate and postgraduate students to participate in the exchange programme and in international research projects at universities abroad as part of their studies for writing master and PhD theses under joint supervision. We would like to update and improve the graduate and post-graduate courses in informatics by inviting lecturers from the collaborating institutes covering new additional and complementary topics at the host institute, especially in the field of object-oriented and functional software development, software technology, distributed systems, compiler construction, and dynamic systems that are currently among the most intensively researched areas in computer science. This project would also help us in providing international environment for our students. These plans are strongly connected to the long term development strategy of the Faculty of Informatics at ELTE and of the partner institutions. The long term strategy includes research and the education of programming methodology, functional and object-oriented program development models, compiler construction, iconic programming, programming of control systems and robots, distance education methodology and application of e-learning in technology education, semantic web technologies, next generation networks and performance evaluation. Undergraduate students either spend a whole semester at the host institution or participate in an intensive course. In both cases students receive credits for the completed courses. In the academic year 2015/2016 we plan to continue the revised BSc programme, and the 8th year of our new MSc programmes at several universities of our network. Our CEEPUS programme considerably contributes to the exchange of the experiences of the new programmes. The common curricula development and the guest lectures highly increase the quality of the planned MSc courses providing state-of-the-art knowledge for the students. Besides student- and lecturer exchange the partners in the HU-0019 network intensely cooperate in elaborating joint degree/training programs, harmonizing study programs, and they work together in several european projects. We negotiate with our partners to consider the possibilities regarding joint and double degrees at their university, in their country. We have discussions with the selected partners about joint curriculum. Because of the administrative and technical difficulties of a joint accreditation, we run and prefer double degree master and PhD programmes. We agreed on joint supervision and on joint practical training among several partners of the network. Joint programs Thanks to the CEEPUS partnership we prepared joint projects. The joint research proposal "Programm-Verifikation mit Hilfe algebraischer Methoden" of ELTE, Budapest and the Research Institute for Symbolic Computation, JKU was supported by the Austrian-Hungarian Action Foundation in 2007. Joint practical training The coordinator institution cooperates with companies, which are able to host about 100 students every year for practical training in Budapest. Babes-Bolyai University, Cluj offers practical training possibilities too. We plan to motivate students from our network by involving them in vocational training at companies. Nine partners of the network signed the agreement for the joint practical training and mutual acceptance of the students' credits. BSc, MSc and PhD students of CEEPUS partners are invited to join the internship programmes. The coordinator institution runs training collaboration, internship programme with Morgan Stanley Hungary Analytics Ltd., Ericsson Hungary and Nokia Hungary. This offers a unique possibility to gain practical experience in the real corporate world. Morgan Stanley Business Service and Technology Centre provide support across a variety of services including Information Technology, Financial Control, Operations, Credit Risk and Documentation. Babes-Bolyai University cooperates with Evoline SRL. Evoline is one of Transylvania's most significant software companies. It offers internships, these interns will be able to collaborate in the realization and extension of IT projects, they will participate in the analysis,

development, testing and documentation of the software systems. Joint thesis supervision The successful joint thesis supervisions of the last years continue with other partners as well. The participating universities are: János Selye University in Komárno, Constantin the Philosopher University at Nitra, University of Maribor, Babes-Bolyai University of Cluj-Napoca, University of Szeged, Technical University of Kosice, Paisii Hilendarski University of Plovdiv and Eötvös Loránd University, Budapest. New joint MSc and PhD supervisions are planned within the network. Joint and double degrees Our network offers four double degree programs: 1. Students from Cluj and Budapest joined the International Master Program in Computer Science in Linz (RISC) and 21 students have received double degree MSc since 2008. Professor Hanspeter Mössenböck (Johannes Kepler University, Linz) received the honorary degree of "Doctor Honoris Causa" from Eötvös Loránd University in May 2006. 2. We established an agreement on a double degree PhD program between Budapest and Cluj in 2008. Four students joined this double degree programme since then, three of them defended in 2011/12. The cooperation on doctoral level (co-tutelle) between BBU and ELTE continued successfully, in 2014 one of the participating PhD students absolved the regular doctoral training and will start his doctoral procedure in the near future, and 2 new students applied successfully to the curriculum. 3. ELTE University and Sapientia University started in international cooperation a Computer Science MSc program which was successfully accredited at Sapientia University, and started in 2014 with the participation of 4 teachers from ELTE. 4. The new Computer Science MSc program of Babes-Bolyai University (Cluj) was accredited in accordance with the Computer Science Master curriculum of ELTE. Thereafter BBU and ELTE signed a bilateral agreement, which enables the 2 universities to launch double degree programmes besides Informatics also in other disciplines as well. Prof. Zoltán Horváth, coordinator of the CEEPUS network, was awarded the honorary doctoral degree by the university BBU as aknowledgment of his efforts made towards the cooperation. The CEEPUS project helps to deepen the relationship between the participating institutions. Furthermore it supports the development of a network of Central-European universities. During our collaboration we have developed courses which harmonize with the curricula of all participating institutions. Every participating institute has relationships with several other universities beside the ones that participate in this CEEPUS network, which enlarges the dissemination possibilities of our results. The Informatics Section of the National Scientific Students' Association Conference (OTDK) will be organized by the University of Szeged in the spring of 2015. This is a biannual conference which gives the opportunity for the most talented bachelor and master students to present their research results. It can be a good base for their further doctoral studies. Besides universities in Hungary we expect participants from Babes-Bolyai University, Constantine the Philosopher University (Nitra, Slovakia), Technical University of Košice, Subotica Tech (former Technical College), János Selye University, and Sapientia Hungarian University of Transylvania. The short term benefits of the joint projects The international collaboration significantly improves the knowledge and abilities of the academic staff and students involved, since the results of the co-operating institutions are well-known and respected world-wide. The new teaching programs developed in connection with this project are useful for the graduate and postgraduate programs in informatics at the participating universities. Approximately 10000 graduate and 200 postgraduate (PhD) students in the field of computer science and 150 professors would benefit from this collaboration directly at the participating institutes, at Eötvös Loránd University, Budapest and at the partners. Other Hungarian, Austrian, Romanian, Bulgarian, Slovak, Czech, Macedonian, Slovenian, and Serbian universities and the higher education of informatics in Central Europe can also benefit from this project indirectly via dissemination of results of the curricula development and via

application of distance education methods. The results will be documented in English and in the native languages of the participants (German, Hungarian, Romanian, Bulgarian, Slovenian, Serbian and Slovak). In the home countries of the participating institutes the industry looks for highly qualified programmers and software designers. This project improves the quality of the education and helps to increase the number of qualified graduates. Connection of the project proposed to the existing educational system The undergraduate courses in computer science at the coordinating and partner institutions among others include the following disciplines: "Software Engineering", "Programming Languages", "Compiler Construction", "Disciplines of Parallel Programming", and these are followed in the graduate course with: "Programming Theory", "Programming Languages II-III", "Functional Programming", "Implementation of Functional Languages", "The Eiffel Programming Language", "Formal Semantics", "The Java Programming Language"; and the postgraduate courses complete these with "Object-Oriented Software Development", "Concurrent Programs and Temporal Logic", "Comparing Analysis of Programming Languages", "Computational Linguistics", „Iconic Programming", "Programming of Control Systems and Robots", "Distance Education Methodology", "Application of e-learning in Technology Education", "Semantic Web technologies", "Next Generation Networks" and "Performance evaluation". The materials of these courses were developed by teachers of the institutions involved in the collaboration. Our network co-operates with EIT ICT Labs which is EIT's (European Institute for Innovation and Technology) KIC for Information and Communications Technology (http://www.eitictlabs.eu/). It aims to fulfill this mission by establishing a new type of partnership between leading companies, research centres, and universities in Europe. The results of this co-operation are disseminated in a wider area also with the help of our CEEPUS network. ELTE as the leader of the program's Hungarian node has involved its CEEPUS partners into the Outreach Program of the network (to develop a partnership with those member states of the European Union where the current EIT ICT Labs nodes are not located). The members of the networks are leading universities, ICT companies and research institutes in Western Europe. CEEPUS partners are invited to the events of the Hungarian node, and they presented on events in Cluj Napoca, Maribor, Ljubljana, Prague, Bratislava and Klagenfurt the double degree programs of EIT ICT Labs, the improvement possibilities of the universities innovation ecosystem and the support programms of ICT start-ups. This co-operation offers opportunities for both students and researchers. They can participate in the high-level education programmes and get to know the state-of-the-art research of the EIT ICT Labs network. Thanks to this cooperation full MSc program in English language is available for incoming students at ELTE, and they can choose also Service Design Engineering and Security and Privacy courses, which are part of the double degree Master Program. PhD students in joint supervision can also join to the EIT ICT Labs Doctoral Training Center. As the main asset of the EIT ICT Labs is to grow the innovative potential of its partners and of Europe, our CEEPUS partners can get a deeper insight in ongoing innovation procedures. Students can attend the Innovation and Entrepreneurship courses elaborated by the consortium of 21 universities in 9 countries, while academic staff may be invited as guest lecturers for summer schools and be involved in research activities by experimenting work attitude in the co-location centres. We introduce an initiative considered as added value to a regional Central European strategic networking in order to solve actual problems of higher education such as meeting labour market demands, development of teaching and learning methodologies, enhancement of the quality of graduates. There is growing demand from the side of educators for solid, prosperous and attractive career models for teachers in universities, which are able to be as seductive as career paths in the private sector. It is a matter of some urgency to educate a new generation of highly skilled teachers and retain them for university

career. We provide a forum for participating countries to share experiences on problematic issues in order to work out institution- and region-specific solutions. We plan to contribute to the Danube Region strategy. University of Novi Sad, University of Maribor and ELTE are developing a strategy together to support the 7th priority area (Knowledge Society) through cooperation and joint activities in the field of ICT. Six universities from our network are members of the Danube Rectors' Conference. It is an already existing structure which is an excellent base for further cooperation. ELTE is also the coordinator of the EIT ICT Labs X-Europe programme which aims to develop a sustainable strategic relationship with the so called "X-Europe countries" (countries which are not directly linked to the EIT ICT Labs) in order to enhance the exchange of good practices and a greater mobility of students and professionals. With the help of our CEEPUS network, X-Europe network and the Danube Rectors Conference we will be able to efficiently support the Danube Region in achieving the goals of the 7th priority area. Paisii Hilendasrki University of Plovdiv plans to organize an intensive course in 2016 for their incoming students just as in the previous years. They always cover interesting and current topics in the field of Computer Science. They expect about 10-15 participants. Thanks to state-of-the-art topics, these intensive courses are very appreciated by the students. Participating in an intensive course is a good opportunity for students to gain basic knowledge in a special field of computer science which is not taught at their home university. Organizing intensive courses is a very efficient way of using CEEPUS scholarship months. Since the duration of an intensive course is only 1 month, more students can participate and receive credits at the host university. With 15 partners we plan about 40 student exchanges, 90 short term student exchanges and 60 guest lectures for the next academic year. Student exchange is a very good opportunity for talented bachelor and master students to spend a whole semester in a foreign country, take courses that are not available at their home institution and get to know the culture of the host country. Short term exchange is a valuable opportunity for students who work on their master's/doctoral thesis to spend a month at another university and consult researchers to give additional value to their thesis topics. Guest lectures are very important for the students of the host university as they are able to take a course from a topic which is usually out of scope at their institution. Visiting professors give guest courses on uncovered areas at the receiving institutions, and they developed common curricula on selected new topics in informatics. One of the best things in these guest courses is that they increase the amount of English courses at every university. This gives a larger, richer choice of interesting courses to the guest students who do not speak the language of the host country. Furthermore, these guest courses offer topics and/or aspects that are usually out of scope of the host universities, so they are an important enrichment of the curricula. Our CEEPUS network contributes to the development and evaluation of the curricula for the new BSc and MSc programmes in Computer Science in Hungary. The guest lectures increase the quality of the MSc and PhD courses and are an added value. That is how we can benefit the most from the network: by creating something new thanks to our joint efforts. Regional and European-level student and staff mobility programs involving academic and industrial partners enable us to integrate research and education in innovative projects and include it to the education at master level, such as Software Technology Labs. The major advantage to use real industrial projects in the education of software engineering compared to university exercises is the growth of collective and individual responsibility in maintaining high quality and respecting deadlines. The fact that the results of the projects are used in the software industry is highly motivating for the students. Ericsson Hungary and Morgan Stanley Hungary permit the release of the products with an open-source licence and the publication of the research results. ELTE organises the Carpathian Basin Summer University for Hungarian students from outside the country. This summer university has

been organized annualy for 16 years. The aim is to enable Hungarian students from the neighbouring countries to attend courses on special areas of their study field. The summer university is also like a coordinator meeting for the half of the network: professors of ELTE, Sapientia, Babes-Bolyai University, Constantine the Philosopher University, Subotica Tech, János Selye University and Subotica Tech took part and discussed actual topics. With the help of this program we reach talented, spirited students, and the visiting students usually return in the following years as Ceepus students. The popular program has more than 150 participants each year. We expect participants from Sapientia, Babes-Bolyai University, Constantine the Philosopher University (Nitra, Slovakia), Technical University of Košice, Subotica Tech, János Selye University, University of Novi Sad and Subotica Tech. Our network organizes the Central-European Functional Programming School, every second year since 2005. Three of the summer schools (2005, 2011, 2013) were also supported by ERASMUS Intensive Program. These events lead to new relationships between universities, common research and curricula development on international level. We plan to continue the Central European Functional Programming School series in the summer of 2016 in Kosice. We usually organise this summer school every 2 years. The plan was to organise it 2015 as well, but because of lack of financial support we need to postpone it. The lectures of this conference are always of very high level, the revised text of the lecture notes are published in the Lecture Notes in Computer Science (LNCS) series of Springer. We plan to invite prominent researchers in the field of functional programming from all over Europe. We expect around 100 participating students, most of them from CEEPUS partners. The Central European Functional Programming Summer school was organized in 2013 at Cluj-Napoca – Springer has accepted the lecture notes of the conference, which will be published under LNCS 8086, editing is currently in progress. The volume of the revised selected papers of the 4th Central European Functional Programming School, 2011 is available at http://link.springer.com/book/10.1007%2F978-3-642-32096-5. Partners of the network organise together conferences, which give several PhD students the opportunity to publish their research results. Some of the planned conferences are: SQAMIA 2015 – Maribor; SISY 2015 Subotica SAMI 2016 Herl'any, Slovakia MACS 2016 Budapest CSCS 2016 Szeged Three of the partners (Linz, Budapest and Maribor) are among the organizers of the most important European conference on Object Oriented Programming, ECOOP. The Hungarian National Scientific Conference of Students in computer science was held in Budapest in 2005, in Miskolc in 2007, in Debrecen in 2009, and in Budapest in 2011 and 2013. The call is open for students from other Central-European countries e.g.: Cluj-Napoca and Komarno are regularly represented at the conference. This provides new dimensions to our CEEPUS network and to the Central-European higher education co-operations. The conference will be organized by the University of Szeged in 2015. Just as in the past years guest professors gave many interesting lectures at the host institutions. Some of them are shown in the table below. Similar courses will be given in the academic year 2015/16. Host institution Home institution Lecturer Course Johannes Kepler University, Linz János Selye University in Komárno Stoffa, Veronika Selected Methods for Modelling and Simulation Johannes Kepler University, Linz University of Maribor Šprogar, Matej Evolutionary Construction of Decision Trees Eötvös Loránd University, Budapest Budapest Sapientia University of Cluj-Napoca, Targu-Mures Kátai, Zoltán Dynamic programming and applications University of Ljubljana János Selye University in Komárno Stoffa, Veronika Methods and techniques for generating pseudorandom numbers University of Novi Sad Technical University in Kosice Steingartner, William Semantics of programming languages Sapientia University of Cluj-Napoca, Targu-Mures Eötvös Loránd University, Budapest Budapest Szugyi, Zalán Efficient use of STL library Sapientia University of Cluj-Napoca, Targu-Mures János Selye University in

Komárno Gubo, Stefan Selected Chapters from Theory of Formal Languages and Automata, Selected Chapters from Graph Theory Sapientia University of Cluj-Napoca, Targu-Mures University of Novi Sad Ivanovic , Mirjana Case-Base Reasoning and Applications University of Szeged Polytechnical Engineering College, Subotica Papp, Zoltán Numerical solutions of high dimensional, monoton nonlinear systems of equations University of Szeged Polytechnical Engineering College, Subotica Pintér, Róbert Applications of learning styles in curriculum development University of Maribor Eötvös Loránd University, Budapest Budapest Zsók, Viktória Functional programming research challenge / Introduction to functional programming János Selye University in Komárno Eötvös Loránd University, Budapest Budapest Gregorics, Tibor Models in artificial intelligence and the path finding problems János Selye University in Komárno Polytechnical Engineering College, Subotica Szedmina, Livia Multimedia language teaching, From Vikings to Whiskey János Selye University in Komárno Polytechnical Engineering College, Subotica Poth, Miklós Genetic algorithms, Artificial neural networks Constantine The Philosopher University in Nitra University of Szeged Blázsik, Zoltán On k-colorable graphs and k-chromatic critical graphs Constantine The Philosopher University in Nitra Babes-Bolyai University of Cluj-Napoca Bocsi, Botond Attila Introduction to Machine Learning Technical University in Kosice Eötvös Loránd University, Budapest Budapest Zsók, Viktória Parallel functional programming language elements Technical University in Kosice University of Novi Sad Mitrovic, Dejan Distributed frameworks for software agents Technical University in Kosice Johannes Kepler University, Linz Sonntag, Michael Introduction to Cryptography, Research in Security and its Interconnection with Law Technical University in Kosice University of Maribor Hericko, Marjan UML and OOP with Java, Design patterns, Selecting the most appropriate design patterns Faculty of Mathematics and Informatics of Cluj benefits from the CEEPUS program in many ways. In Cluj lectures are given not only in Romanian, but also in Hungarian and in German. Therefore they gladly accept professors from Austria and Hungary. Prof. Zoltán Horváth from Budapest regularly gives lectures as visiting professor in Cluj-Napoca in Hungarian about Specification and Implementation of Distributed Systems and Advanced Functional Programming. Professor Zoltán Csörnyei published lecture notes on compiler construction for students in Cluj. Katalin Pásztor-Varga presents lectures on “Application of mathematical logic in programming and in electronic engineering”. At ELTE full BSc and MSc program is available in English language, which facilitates the participation incoming students in the education. Tibor Gregorics from ELTE regularly gives the course Introduction to Artificial Intelligence at János Selye University. University of Novi Sad coordinated a joint Master in Software Technology; the CEEPUS network supports the dissemination of the results. At Sapientia University’s MSc training regular guest lecturers are Tibor Gregorics, Tamás Kozsik and Attila Kovács from ELTE Budapest. We published papers and volumes disseminating the results of the CEEPUS network in the last academic year just as in the previous years. We published joint papers and continued joint thesis supervisions as well. Some of the successful publications of the last few years: First Summer School, CEFP 2005, Budapest, Hungary, July 2005. Lecture Notes in Computer Science (ISSN 0302-9743), vol. 4164. Springer, 2006. Second Summer School, CEFP 2007. Revised Selected Lectures. Lecture Notes in Computer Science,(ISSN 0302-9743), vol. 5161. Springer 2008. Third Summer School, CEFP 2009. Revised Selected Lectures. Lecture Notes in Computer Science, (ISSN 0302-9743), vol. 6299. Springer 2010. Fourth Summer School, CEFP 2011. Revised Selected Lectures. Lecture Notes in Computer Science, (ISSN 0302-9743), vol. 7241. Springer 2012. Fourth Summer School, CEFP 2011. Revised Selected Lectures. Lecture Notes in Computer Science, (ISSN 0302-9743), vol. 7241. Springer 2012. Fifth Summer School, CEFP 2013. Revised Selected Lectures. Lecture Notes in Computer Science, (ISSN 0302-9743), vol. 8086. Springer 2015. 1. V. Zsók, Z. Horváth, and R.

Plasmeijer (Eds.): Central European Functional Programming Summer School, CEFP 2011, Lecture Notes in Computer Science, LNCS vol. 7241, Springer 2012. (http://www.springer.com/computer/swe/book/978-3-642-32095-8) 2. GERLEC, Crt, RAKIC, Gordana, BUDIMAC, Zoran, HERICKO, Marjan. A programming language independent framework for metrics-based software evolution and analysis. Comput. Sci. Inf. Syst., 2012, vol. 9, iss. 3, str. 1155-1186, doi: 10.2298/CSIS120104026G. 3. Zoltán Horváth, Melinda Tóth, Tamás Kozsik: More Than Types: 2nd Workshop on Software Quality, Analysis, Monitoring, Improvement, and Applications, SQAMIA 2013, Novi Sad, Sep. 16, 2013., Invited talk. 4. T. Kozsik, A. Lörincz, D. Juhász, L. Domoszlai, D. Horpácsi, M. Tóth, Z. Horváth: Workflow Description in Cyber-Physical Systems, Studia Universitatis Babes-Bolyai Series Informatica, INFORMATICA 2, 20-30 p. 5. Vukovic, S., Löberbauer, M., Covic, Z., Ivkovic, M.: Development of a Multiplatform CMS System with the Zend Framework, International Conference on Applied Internet and Information Technologies, ICAIIT 2012, October 26, 2012, Zrenjanin, Serbia 6. Miloš Savic, Zoran Budimac, Gordana Rakic, Mirjana Ivanovic and Marjan Hericko, SSQSA Ontology Metrics Front-End, SQAMIA 2013, 2nd Workshop on Software Quality Analysis, Monitoring, Improvement, and Applications, September 15-17, 2013, Novi Sad, Serbia 7. Zoltán Horváth: Cooperation in Computer Science - a CEEPUS network, Danube Rector's Conference: University of Excellence, 5 Nov., 2010.) http://conference.ubbcluj.ro/drc_excellence/files/brochureExcellence2010.pdf 8. Zoltán Horváth, Tamás Kozsik, and László Lövei. Software engineering education in cooperation with industrial partners. Teaching Mathematics and Computer Science, 8(1):133-148, 2010 (http://tmcs.math.klte.hu/Contents/2010-Vol-VIII-Issue-I/tmcs-2010-1-horvath-kozsik-lovei-abstract.pdf) 9. M. Löberbauer, R. Wolfinger, M. Jahn and H. Mössenböck: Testing the Composability of Plug-and-Play Components . A Method for Unit Testing of Dynamically Composed Applications 10. Cs. Szabó, F. Hrozek, B. Sobota: Preparing Panoramic Pictures for Visualization of City Agglomerations 11. Zsolt Bálint, Károly Simon: On-line Preferansz and Robot Player Implementations 12. G. Dévai: Meta programming on the proof level. Acta Universitatis Sapientiae, Informatica, 1(1):15-34, 2009 13. Z. Szugyi, N. Pataki, J. Mihalicza, Z. Porkoláb: C++ Method Utilities. Proceedings of the Tenth International Conference on Informatics. Informatics 2009. Her'lany, Slovakia 14. G. Dévai, Z. Gera, Z. Horváth, G. Páli, M. Tejfel: Feldspar - A Functional Embedded Language for Digital Signal Processing. ICAI 2010, 8th International Conferenceon Applied Informatics 2010, Eger, Hungary 15. G. Páli, T. Kozsik: Measuring SoftwareComplexity by Types. ICAI 2010 8th International Conference on Applied Informatics 2010, Eger, Hungary 16. G. Alagi, Z. Csörnyei- K. Pásztor Varga: Parallel programming techniques and linear type systems. MaCS 2010 8th Joint Conference on Mathematics and Computer Science 17. R. D. Gaceanu, H. F. Pop: An Adaptive Fuzzy Agent Clustering Algorithm for Search Engines. MaCS 2010 8th Joint Conference on Mathematics and Computer Science 18. T. Kmet: Neural Network Simulation of Feeding Adaptations of Filter Feeders: Daphnia. MaCS 2010 8th Joint Conference on Mathematics and Computer Science 19. V. Zsók: D-Clean Semantics for Distributed Computation. MaCS 2010 8th Joint Conference on Mathematics and Computer Science 20. NOVAK, Jernej (University of Maribor) RAKIC, Gordana (University of Novi Sad). Comparison of software metrics tools for .NET. Proceedings of the 13th international multiconference Information Society - IS 2010, October 11.-15., 2010 : volume A, pp. 227-230. 21. Mirjana Ivanovic, Zoran Putnik, Živana Komlenov (University of Novi Sad) Tatjana Welzer, Marko Hölbl, Tina Schweighofer (University of Maribor): Usability and Privacy Aspects of Moodle: Students' and Teachers' Perspective. (submitted, under review) 22. Furstner, Igor Anisic, Zoran: Subotica Tech - College of Applied Sciences, Republic of Serbia. In: Computational Intelligence and Informatics (CINTI), 2010 11th International Symposium

on 18-20 Nov. 2010; 245 - 250; ISBN: 978-1-4244-9279-4 23. Livia, Szedmina: Experiences from Using Skype in Language Teaching = Proceedings of SISY 2010 – Symposium on Intelligent Systems and Informatics, Subotica, Serbia, Sept 10-11, 2010, 449-452, ISBN 978-1-4244-7395-3. 24. Z. Horváth, I. Barna, P. Bauer, K.Bernád, Z. Hernáth, B. Koszegi, G. Kovács, T. Kozsik, Z. Lengyel, R. Roth, S. Sike, G. Takács: A Client-Server Model for Editing ODF Documents on Mobile devices, Acta Electrotechnica et Informatica, Vol. 11, No. 3, 2011, 17-20. 25. R. Pinter, S. Maravic Cisar, D. Radosav, Extending the Learning Object Metadata with "Recommended" Parameters, 9th International Symposium on Intelligent Systems and Informatics SISY 2011, Subotica, Serbia, September 8-10, 2011., Proceedings CD ROM, IEEE Catalog, Number: CFP1184C-CDR, ISBN: 978-1-4577-1974-5, pp. 437-440 26. Poth Miklos: Discrete Tomographic Reconstruction of Binary Matrices Using Tabu Search and Classic Ryser Algorithm, 9th International Symposium on Intelligent Systems and Informatics, September 8-10, 2011, Subotica, Serbia, pp. 387-390. ISBN: 978-1-4577-1973-8, IEEE Catalog Number: CFP1184C-CDR 27. Tejfel, M., Tóth, M., Bozó, I., Horpácsi, D., and Horváth, Z.: Improving Quality of Software Analyser and Transformer Tools using Specification Based Testing In Selected papers of 9th Joint Conference on Mathematics and Computer Science, ANNALES Universitatis Scientiarum Budapestinensis de Rolando Eötvös Nominatae Sectio Computatorica, ISSN: 0138-9491, volume 37, pages 355–368, 2012 28. Papp Zoltán (Subotica): Journal: Applied Mathematics and Computation. Corresponding Author: Sanja Rapajic, Co-Authors: Zoltan Papp; Title: FR type methods for systems of large-scale nonlinear monotone equations 29. Póth Miklós (Subotica): Particle Swarm Optimization Approach to Discrete Tomography Reconstruction Problems of Binary Matrices In: SISY 2014 proceedings, CFP14846-US. For 2015/2016 we envisage similar joint publications. The results of the joint thesis supervisions, joint research activities and teaching co-operations are presented at conferences and published in proceedings, journals, reviews, book-chapters. Many students taking part in the CEEPUS programme are PhD students, who carry out studies at partner institutes and gain state-of-the-art knowledge on dynamically extending topics in informatics: - Szilágyi Péter (Babes-Bolyai, Cluj-Napoca) absolved his PhD studies in the Joint PhD Program between Babes-Bolyai University and ELTE. He will hand in his PhD thesis in 2015 and will defend it he academic year 2015/16. Szilágyi Péter is also student int he EIT ICT Labs Dovtoral Training Center. - Gergely Dévai (ELTE, Budapest), carried out research at the Research Institute on Symbolic Computation (RISC), Linz on his PhD thesis, he also will hand in his PhD thesis thesis in 2015 and will defend int he academic year 2015/16. - Jaroslav Porubän (TUKE Kosice) cooperates with the Institute for Software System on domain specific languages About 15 PhD students from the universities of the network finished their PhD thesis much earlier due to their visits. There were three thesis defences in the double degree PhD programme run by Cluj-Napoca and ELTE in 2011/12. Several students have spent a whole semester at the University of Linz and at other partners and collected significant number of credits in various domains of computer science. The students had the chance to participate in research projects at other universities as part of their studies for writing master or PhD thesis. They participated in joint works of the universities (publishing textbooks, writing publications and scientific papers as co-authors, translating famous books of the computer science literature, etc.). The exchange students acquire up-to-date knowledge at the receiving institutions. The PhD and master students are actively involved in the next academic year’s exchange mobility and joint activities too. The CEEPUS network made it possible to gain professional experiences and establish new research projects. Partners are coordinating research projects getting together senior researchers and professors with talented young PhD students and graduate students. These projects and their disseminated results are well-known on national and international level (examples of research

projects coordinated by CEEPUS members: Correctness of Distributed Functional Programs; Compiler Generation Tools for C#; Static Single Assignment Form and Register Allocation in a Java JIT Compiler; Software Infrastructure for Pervasive Computing; Component-Based Programming: Tools and Languages for Component-Assembly; Flexible Notification Semantics in Distributed Objects Systems; Establishment and Operation of the Regional Distance Education Study Centre in the University of Plovdiv; Formalisation of natural languages and working out of a linguistic processor; Development of methods for automated construction of machine dictionaries; Creation of a formal and computer model of a morphological processor; Creation of computer dictionaries and a morphological processor for the Bulgarian language). Pedagogical and didactic methods In each subject listed above, the students would use their acquired knowledge to design and to develop software with practical use, or process the related literature. The graduate students, for example, would make case studies about the subject in question, and these studies would be placed to one of the server computers at the coordinator and would be accessible through the Internet for everybody. The postgraduate students could be involved in writing new, current textbooks about software engineering, concepts of programming languages and object-oriented distributed systems. The participating institutes incorporate the standardized notations of object-oriented design and plan to teach it using multimedia tools in their education. The institutes apply and evaluate the methods of distance education, e-learning and web technologies in the field of Computer Science utilising also advanced technologies of our industrial (silent) partner, Cisco, Samsung. Full academic recognition is given to the successfully completed studies of the visiting students at the participating institutions. Regular communication through internet will be established between the supervisors at the sending and receiving institutions of the visiting students. Regular (virtual) meetings will be held to evaluate the quality of the collaboration.