



UNIVERSITY OF NOVI SAD
FACULTY OF TECHNICAL SCIENCES

2015/2016

OVERVIEW OF INTERNATIONAL PROJECTS

INTERNATIONAL COOPERATION

POWER



CIP - Каталогизација у публикацији
Библиотека Матице српске, Нови Сад
378.6:62 (497.113 Novi Sad)"2015/2016"(083.9)

OVERVIEW OF INTERNATIONAL PROJECTS - University of Novi Sad - Faculty of Technical Sciences: 2015/2016.-Novi Sad: Faculty of Technical Sciences, 2016 (Novi Sad: GRID). [76] str. : ilustr.; 24cm

Editorial Board Address ISBN 978-86-7892-873-4
Trg Dositeja Obradovića 6, 21000 Novi Sad,
Serbia Phone: (381-21) 485-2056
e-mail: iro.ftn@uns.ac.rs

Editorial Board International Relations Office
Technical Design Prof. dr Dragan Šešlija, Valentina Vrebalov, Vladimir Todorović
Printing approved by Publishing Council, Faculty of Technical Sciences
Printed by Graphic Center – GRID, Faculty of Technical Sciences
in 100 copies, December 2016.

a) Факултет техничких наука (Нови Сад) - 2015-2016 - Пројекти
COBISS.SR-ID 310758407

OVERVIEW OF INTERNATIONAL PROJECTS
University of Novi Sad
Faculty of Technical Sciences
2015/2016

CONTENTS

| | |
|----------------------------|----|
| Foreword..... | 3 |
| H2020..... | 5 |
| EUREKA..... | 9 |
| CEEPUS..... | 11 |
| COST..... | 35 |
| ERASMUS+..... | 49 |
| FP7..... | 56 |
| TEMPUS..... | 64 |
| SCOPES | 69 |
| BILATERAL COOPERATION..... | 71 |

FOREWORD

As the origin of the word University is coming from the Latin *universitas* 'the whole' or in late Latin 'society, guild', development of the university education is closely connected with the research of 'the whole'. Namely, universities are the places where the researchers and educators are searching for the new knowledge taking in account no borders. Around the world, countries have recognised that research universities are the key to the knowledge economy what is one of the most important goals of the EU.

Faculty of Technical Sciences from the University of Novi Sad is such a place where the research spirit is nurtured in order to maintain the basic idea of universal knowledge. As it is widely known, research can be split, at the most basic level, into two types, 'pure research' and 'applied research' but at the Faculty of Technical Sciences we are performing both of them. In such a way, we are part of an active community of institutions that share values, foci, and mission.

It is particularly important for the research universities in low- and middle-income countries, such as Serbia, to have crucial role in developing effective academic systems in order to make it possible for their countries to join and compete in sophisticated knowledge economies.

Researchers from the Faculty of Technical Sciences are committed to the creation and dissemination of knowledge in a range of disciplines and fields. In that sense, Faculty of Technical Sciences is providing the appropriate laboratories, libraries, and other infrastructures that enable teaching and research at the highest possible level. Besides, Doctoral studies, at the Faculty of Technical Sciences, are very developed encompassing a large number of PhD students that have to be included in up to date research. With the internationalization of research what is mostly done with international projects and other ways of international cooperation, PhD students, as well as assistants and young researchers, have opportunity to be included in current scientific trends in their fields of research. Also, Faculty of Technical Sciences, with this involvement, is steadily improving reputation and competitiveness on the international stage.

So far, there were around 250 projects supported by Serbian and Provincial Ministry of Science and Technology and more than 200 international projects realized within different frameworks: FP6, FP7, H2020, EUREKA, COST, IPA, TEMPUS, ERASMUS+ and CEEPUS. In period 2015-2016 researchers at the Faculty of Technical Sciences participated in three H2020, seven FP7, one Eureka, one Scopes, six Erasmus+ KA2, four Tempus, 13 COST, 15 Bilateral and 23 CEEPUS projects.

With this publication, Faculty of Technical Sciences is representing the current state in the field of international research that is undertaking in our laboratories.

Prof. dr Dragan Šešlija
Vice-dean for Science and International cooperation

INTERNATIONAL COOPERATION PROJECTS

2015/2016

A BILATERAL COOPERATION

B CEEPUS

C COST

D ERASMUS+ KA2

E EUREKA

F FP7

G H2020

H SCOPES

I TEMPUS

J TOTAL



Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.

Horizon 2020 is the financial instrument implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness.

Seen as a means to drive economic growth and create jobs, Horizon 2020 has the political backing of Europe's leaders and the Members of the European Parliament. They agreed that research is an investment in our future and so put it at the heart of the EU's blueprint for smart, sustainable and inclusive growth and jobs.

By coupling research and innovation, Horizon 2020 is helping to achieve this with its emphasis on excellent science, industrial leadership and tackling societal challenges. The goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation.

Horizon 2020 is open to everyone, with a simple structure that reduces red tape and time so participants can focus on what is really important. This approach makes sure new projects get off the ground quickly – and achieve results faster.

The EU Framework Programme for Research and Innovation will be complemented by further measures to complete and further develop the European Research Area. These measures will aim at breaking down barriers to create a genuine single market for knowledge, research and innovation.



1. FULL Duplex Active Cancellation for wireless communication and co-exisTence - FUDACT

Description: The development of fifth-generation (5G) wireless networks is expected to provide technologies to support 1000x increase in data rates. To support the vision of hundreds of billions of connected devices after year 2020, many of the new technologies need to be developed. 5G is expected to utilize many more spectral bands, several of them at millimeter-wave frequencies, and much denser deployment of wireless infrastructure. As a result, co-existence between systems will be the key problem to be addressed at the physical level. In "Full Duplex Active Cancellation for wireless communication and co-exisTence" (FUDACT) we explore a set of new co-existence technologies culminating in a new radio transmission paradigm to improve spectrum efficiency. The FUDACT goal is to support two Europe 2020 flagship initiatives: Digital agenda for Europe by addressing some of the H2020 Future Internet challenges and Innovation Union by paving the way to innovation-friendly environment. FUDACT aims at a fundamental understanding of limitations of active self-cancellation techniques under conditions of simultaneous transmission and reception in close or overlapping frequency bands. The project's primary goal is to deliver a solution for a shared antenna system capable of cancelling at least a 1W transmitter (densely deployed small cells in wireless infrastructure) in the receive band, a great research challenge advancing the state of the art by at least 2 orders of magnitude.

Contact person: Doc. Dr Mirjana Videnović Mišić

Period of realization: 2015 – 2018

ID: 656940 — FUDACT — H2020-MSCA-IF-2014



European
Commission

Horizon 2020
European Union funding
for Research & Innovation

2. SENSors and Intelligence in Built Environment – SENSIBLE

Description: The goal of this project is to develop novel information sensing research and innovation approaches for acquiring, communicating and processing a large volume of heterogeneous datasets in the context of smart buildings, by building an international, inter-disciplinary and inter-sectoral collaboration network through research and innovation staff exchanges and seamless exchange of ideas, expertise, data, testbeds, and know-how. The need to sense and process ever increasing amount of data requires novel engineering that goes far beyond conventional centralised methods, where signal acquisition, communications and data processing are performed centrally and independently. Building on integrating signal acquisition, communications and information extraction into an overarching smart sensing approach, the project will provide a holistic decision support framework for non-residential buildings of the future. The key challenges of providing intelligence to the building lie in ubiquitous sensing, inside and outside the building, and connecting the sensing technology to people and outside world via meaningful decision support. Though significant research has been dedicated to developing novel sensing and instrumentation technologies, further research and innovation advances are needed to integrate physical sensing to data processing via distributed estimation and fusion approaches, giving actionable meaning to the suite of collected data. In that context, it is necessary not only to continuously monitor the environment, equipment, systems and processes, but also to sense occupants' behaviour inside and outside the building and provide timely response and feedback.

Contact person: Prof. Dr Dejan Vukobratović

Period of realization: 2016 – 2020

ID: H2020-MCSA-RISE-2016 – 734331



3. COolest Of Labs Hottest Of Theories — COOLandHOT

Description: The project proposal under the title Cool & Hot (COlest Of Labs & Hottest Of Theories) mixes, blends and unites faces, voices, results and energies of many generations of researchers in offering the public at large, regardless of their age and scientific background, the opportunity to get up-close and personal with researchers. However, a special emphasis in this project will be given to inspiring and motivating next generations of scientists. Since young adults are all about what is hot and what is cool, we have chosen to focus on those specific aspects of science and researchers. The outlined concept and the content planned will help achieving the following specific objectives:

- To break and demystify the persistent and repeated stereotypes about researchers;
- To bring out the actual researchers in Serbia, engage them publically and increase their recognition in Serbian society – locally, but globally as well;
- To promote research carried out in Serbia and researchers as role models;
- To unveil the motives behind becoming a researcher;
- To entice the young to embark on scientific careers;
- To raise public awareness of the researchers' contribution to progress and development;
- To raise public awareness about climate changes and global warming;
- To highlight the importance of the EU's manifold support to researchers and scientific research work in Serbia;
- To improve networking with other national/international projects involved in science popularization, through mutual support of events and exchange of ideas, experiences and people.

Contact person: Vladimir Todorović

Period of realization: 2016 – 2017

ID: H2020-MCSA-PEOPLE-2016 - 722945

EUREKA

innovation across borders

EUREKA is a publicly-funded, intergovernmental network, involving over 40 countries. EUREKA's aim is to enhance European competitiveness by fostering innovation-driven entrepreneurship in Europe, between small and large industry, research institutes and universities. By doing this, EUREKA concentrates the existing potential of experts, of knowledge, research facilities and financial resources in a more efficient way. EUREKA is constantly proving its value through a wealth of success stories – innovative products, processes and services that have been launched onto the market over the last 30 years, creating additional turnover and jobs for European companies, small and large – and by supporting the internationalization of businesses with innovative ideas.

EUREKA is a leading open platform for international cooperation in innovation. It is present in over 40 countries and remains to this day the only initiative of its kind committed to the 'bottom-up' principle - ensuring that any R&D project with a good business plan receives the support it deserves, independent of its technological nature, or the type of organisations involved.

1. A platform for the applications of speech technologies on smartphones for the languages of the Danube region - DANSPLAT

Description: The field of speech technology applications has been significantly extended by the emergence of smartphones, which require an efficient voice user interface, e.g. for RSS feed reading, SMS/tweet/email reading or name dialing. The utility of such applications and ultimately their success depends on their ability to support individual languages, and this is one of the problems that will be treated within this project. The project will give rise to a synergy and the exchange of experience, resources and knowledge between partners in order to develop a platform for a range of useful applications of speech technologies on mobile devices using different operating systems, adaptable to the needs of different types of users, from different languages to the persons with complex communication needs. Joint activities on the improvement of the expressiveness and flexibility of text-to-speech synthesis (TTS) will lead to its easier application in a wider range of services. Similarly, increased accuracy and robustness of automatic speech recognition (ASR) in particular domains of interaction, as well as its adaptation to the voice of its user, will increase the range of its application. Many people whose communication capabilities are severely reduced for any of a variety of reasons, use augmentative alternative communication (AAC) instead of conventional means of communication between humans, i.e. speech or written language. They prefer a speech enabled application converting strings of visual symbols into meaningful sentences. The platform based on ASR, TTS and AAC will be developed within a coordinated effort of all project partners, each participating country will adapt it to its language(s), and the project will thus have a significant impact on all multilingual regions within the Danube Region.

Contact person: Prof. dr Vlado Delić

Period of realization: 2016 – 2020



CEEPUS is an acronym for "Central European Exchange Program for University Studies".

CEEPUS is based on lean management. The highest ranking decision making CEEPUS body is the Joint Committee of Ministers that meets once a year and takes all strategic decisions. Coordination, evaluation, program development and advertising are the main tasks of the Central CEEPUS Office (consisting of only two persons). Each country has a National CEEPUS Office in charge of national implementation. In order to avoid setting up new administrative bodies, the National CEEPUS Offices are integrated into already existing structures, usually national agencies.

The main activity of CEEPUS are university networks operating joint programs ideally leading to Joint Degrees, esp. Joint Doctoral Programs. CEEPUS covers mobility grants for students and teachers in this framework.

The main objectives are:

- Focus on joint PhD programs.
- Promote cooperation in the framework of the EUSDR.



1. Image Processing, Information Engineering & Interdisciplinary Knowledge Exchange

Description: The main efforts are educational by organizing five unique schools and one academy. There is continued scientific cooperation of partners and all together about 150 papers, congress contributions and book chapters were published. Due to the involved institutions there is a strong focus on pediatric medicine. All partners share their experience and the network knowledge is used to enhance patient care by operation simulations, improving algorithms. Moreover, a closer cooperation with the American Austrian Foundation – Open Medical Institute (<http://www.aaf-online.org/>) since there is a considerable overlap between the educational activities of CIII-AT-0042-00-1415 and AAF. Background: CEEPUS Network: CIII-AT-0042-00-1516 represents an interdisciplinary network between medical and engineering departments and exist since 1997. Special focus is put on sharing experiences and on cooperation - as an result, eg. we share all our experience in radiation protection in children. The Departments of the Pediatric Center (Dep. of Pediatrics and Adolescent Medicine, Dep. of Pediatrics and Adolescent Surgery, Division of Pediatric Radiology), Medical University Graz/A are leading institution in their field and support their partners where necessary. Therefore, exchange has some asymmetry in favorite of Graz. In order to compensate this five unique schools are organized distributed over all participating institutions and partners. About 150 publications, congress and book contributions, done in cooperation as well as awards, confirm and underline these efforts. Moreover, a document defining the framework for the “These en Cotutelle” is signed by all partners and the “These en Cotutelle” is executed. The close cooperation between engineers and physicians enable successful applications for third party funded, competitive research projects two projects between Graz/A, Skopje/MK and Podgorica/ME – the last one is currently still running.

Contact Person: Prof. dr Nataša Sladoje Matic

Period of realization: 2015 - 2016

ID: CIII-AT-0042-11-1516



2. Applications and diagnostics of electric plasmas

Description: What is plasma and where can we find it? Electrical plasma consists of ionized matter and is frequently called the fourth state of matter. Every gas assumes this state when a sufficiently strong electric current is passed through it or when it is heated to more than about 10000 K or when it is exposed to intensive ionising radiation (UV, X-rays, gamma-rays). More than 99 % of the visible matter of the universe is in the plasma state. The most common method to produce physical, technical or industrial plasma is the application of a dc or ac voltage to a more or less diluted gas and to produce a gas discharge in which electron impact ionization (frequently supported by secondary electron emission) produces sufficient charge carriers to pass an electric current through the gas. Recently, atmospheric plasma has become more important, i.e. discharges in gases at atmospheric pressure, which makes the use of expensive vacuum systems obsolete. Plasma consists of free positive and negative electric charge carriers – most commonly positive single-charged ions and electrons (as the negative charge carriers). But there are also plasmas with a large fraction of negative ions or clusters, which can be of high relevance for technical applications in reactive plasmas. It is the presence of negative and positive charge carriers which determines the behaviour of plasma decisively, since for its theoretical description not only the laws of fluid mechanics, thermodynamics and statistics are required but also those of electrodynamics. For very hot plasmas such as fusion plasmas, also nuclear physics is required (fusion reactions) and, under extreme conditions, plasma particles can even become relativistic. An additional characteristic of plasmas is that the negative charge carriers (most frequently electrons) are much lighter than the positive charge carriers; in the case of hydrogen plasma the mass ratio of electron to ion is 1836. Due to the presence of electric charge carriers, plasma can be manipulated, confined and utilised by electric and magnetic fields.

Contact Person: Prof. dr Branko Škorić

Period of realization: 2015 - 2016

ID: CIII-AT-0063-11-1516



3. Modern Trends in Education and Research on Mechanical Systems - Bridging Reliability, Quality and Tribology

Description: Mechanical engineering is one of the oldest and most diverse branches of engineering and supports industrial development in such areas as manufacturing and production, energy generation and conversion, chemical engineering, transportation, automation, robotics, etc. Nowadays, the existence of general crisis enhances the increasing and continuous need for improved methods of determining the reliability and predicting the lifetime and quality of elements, machines and production systems. This is especially valid for the European countries, particularly in Danube region, and in Central and East European regions. Attention will be turned to the role of tribology for the large and complex scope of reliability engineering and the different tribology-related methods to improve reliability and quality, such as reliability design, component lifetime, condition monitoring, and diagnostics. One of the tasks of tribology is to study and find the advantages from a full investigation of industrial failures, and using tribological knowledge and understanding to establish the causes and the ways of healing them. It is frequently possible to improve reliability and quality substantially by not so complex procedures, once the real cause of the mechanism of the failure is revealed and understood. An illustration can be given in the following consideration. What is wear? The tribological interactions of a solid surface's exposed face with interfacing materials and environment results in loss of material from the surface. The process leading to loss of material is known as wear, one of the most menacing tribological processes. Wear can be minimized by modifying the surface properties of solids by one or more of surface engineering processes or by use of lubricants. Engineered surfaces extend the working life of both original and recycled and resurfaced equipments, thus saving large sums of money and leading to conservation of material, energy and the environment. Methodologies to minimize wear include systematic approaches to diagnose the wear and to prescribe appropriate solutions.

Contact Person: MSc Ivan Knežević

Period of realization: 2015 - 2016

ID: CIII-BG-0703-04-1516



4. Computer Aided Design of automated systems for assembling

Description: Application of the results from the project The working team for the project has the required experience for the project's execution which is apparent from the presented publications of books on the reviewed subject. Also, the team has experience of mutual work with PhD students and companies from the respective industry. Some of the team members have participated in projects of CEEPUS II and International Summer School on 'Advanced Manufacturing Operation' in Bulgaria. II The main elaborations with applicability are the following: A main task is to provide conditions for increase of the creativity of the engineering specialists (students, PhD students and teachers). We will develop the following activities in the long program: > Mobility within the training of students, PhD students and teachers between the teams of the universities of the partner countries; > Application of creative methods and technologies for computer-based designing of mechanical products within the process of training; > Algorithms and applied software products for optimal computer-based designing of mechanical products, and selection of an optimal structurally set scheme, and a system for automated assembling; > Computer-made geometrical models of mechanical products by the use of virtual designing and experimental determination of the behavior of the compound parts during designing of assembled units by a dynamic analysis of resilient elements and hydrodynamic products; > Development of a set of design documents for designing and automated assembling of a mechanical product within a CAD environment, methodology assets and deduction materials; >The concise course of lectures for use expert systems and Product Lifecycle Management in engineering design; > Test control in training of students on Computer-Aided Design and Automated System for Assembling and testing throughout the training for 'Bachelor' and 'Master' degrees. III The network activities: Intensive Courses Lectures and Visiting Professors In the project is made provision that professors from University partners will read a concise course of lectures on related problems.

Contact Person: Prof. dr Siniša Kuzmanović

Period of realization: 2015 - 2016

ID: CIII-BG-0722-04-1516



5. Knowledge Bridge for Students and Teachers in Manufacturing Technologies

Description: Technology is one of the most important fields of knowledge at the whole world. It determines manufacturing of various machines and mechanical equipment. The development of manufacturing methods is dependent on the intensity of research. At present time many central European companies and research centers is based on conventional technologies. Numerically controlled machine tools and modern CAM systems are being employed in the analysis and simulation of technological progressive processes. It is also possible to check the manufacturing accuracy (product dimensions, shape, and surface quality) and test the final products, and also test the durability and reliability of machines and devices. To this thinks should be contribute and can be realized by this project Knowledge Bridge for Students and Teachers in Manufacturing Technologies.

Construed CEEPUS project with name "Knowledge Bridge for Students and Teachers in Manufacturing Technologies" make a goal to create condition to successful cooperation for student, university teachers and young researchers from participant's universities within frame of network and for others universities within frame of freemover mobility. It is possible only by kind of interdisciplinary educational knowledge and multilateral co-operation among universities the European engineers.

Contact Person: Doc. dr Igor Budak

Period of realization: 2015 - 2016

ID: CIII-CZ-0201-08-1516



6. Concurrent Product and Technology Development - Teaching, Research and Implementation of Joint Programs Oriented in Production and Industrial Engineering

Description: According to CEEPUS III Work Programme our developed and promoted university network CEEPUS HR 108 is designed to stimulate academic mobility, in particular regional student mobility i.e. joint programmes in the frame of CII HR 108 network leading up to double i.e joint degrees and joint thesis supervision and planned mobility actions will be set in that direction. We have finalized our curriculum and we are preparing and developing common teaching materials in the frame of curriculum. We unified the methodology of the modern industrial praxis, educational-technological knowledge and curricula. Successful connecting the educational-technological knowledge with the modern industrial praxis and the important topics in industry in the frame of our joint curricula. On the level of joint program strong industrial collaboration of the majority of project partners enabled high educational level. Specialization of each project participant and its implementation into new joint curriculum is promoted. Determining of the optimal structure of our curricula will enable set-up of Join Degree Diplomas, issued by partner universities in participating UE countries. Only with such kind of interdisciplinary educational knowledge and multilateral co-operation among universities the European engineers will be sufficient innovative and enough competitive to successfully implement the Lisabon declaration and the Bologna curriculum process, Education and Training 2020 strategy (ET2020) and Europe 2020 strategy. Through this network we have coordinate our network activities in line with three of five key priorities according to the Education and Training 2020 strategy (ET2020): improving the quality and relevance of teaching and learning, promoting mobility of students and staff and cross-border cooperation and strengthening the "knowledge triangle", linking education, research, and innovation.

Contact Person: Doc. dr Mladimir Milutinovic

Period of realization: 2015 - 2016

ID: CIII-HR-0108-09-1516



7. Research on modern systems for manufacture and measurement of components of machine and devices

Description: General Information Technology, one of the most important fields of knowledge of the modern world, determines the manufacture of various machines and mechanical equipment. The development of manufacturing technologies is dependent on the intensity of research, the aim of which is obtaining high-quality products in mass production at as low costs as possible. Therefore, the investigations carried out by the majority of European research centres concentrate on basic loss and non-loss technologies as well as prospective unconventional manufacturing techniques. Numerically controlled machine tools and also modern computer-aided manufacturing systems are being employed in the analysis and simulation of technological processes. The development of technology and, accordingly, measurement technology enables monitoring of particular stages of the technological process, inspection of the technical conditions of technological machines and devices and control of the production cycle of machine elements. It is also possible to check the manufacturing accuracy (product dimensions, shape, surface quality), evaluate the quality of materials used for the manufacturing of particular machine elements, evaluate and test the final products, and also test the durability and reliability of machines and devices. The functioning of market economy requires that goods should be not only of high quality but also safe, reliable and durable. It is necessary, therefore, to meet the conditions given in appropriate standardisation documents and specifications. Following the guidelines of the ISO 9000 series standards by manufacturing companies is the fundamental factor of integration of the companies from Central Europe with the European Union economy. The implemented standards enable companies to apply the quality assurance systems and, accordingly, receive a certificate for their manufactured products or rendered services. All those who have implemented or are implementing the quality assurance systems know how difficult it is to conduct reliable measurement, control and testing.

Contact Person: Prof. dr Igor Budak

Period of realization: 2015 - 2016

ID: CIII-PL-0007-11-1516



8. Development of Mechanical Engineering

Description: Small and medium industrial companies (SMC), according to the opinion of many experts, are the base of developing countries economy. It concerns especially the economy of Central Europe countries, which formerly had non market economy. Development of mentioned industrial enterprises nowadays depends on proper level of mechanical engineering (design, manufacturing engineering and production management) and, in particular, on proper logistics. All of this demand good level of education from proper specialized institutions especially universities. Exchange of ideas, knowledge, results of investigations, students, teachers etc. is the condition sine qua non of high level of research and education in particular university. Thus, existence of the possibility of mentioned exchange is very important from the point of the development of economy. Technology, one of the most important fields of knowledge of the modern world, determines manufacturing of various machines and mechanical equipment. The development of manufacturing methods is dependent on the intensity of research, the aim of which is obtaining high-quality products in mass production at as low costs as possible. Therefore, the investigations carried out by the majority of European research centres concentrate on basic conventional technologies as well as prospective unconventional manufacturing techniques. Numerically controlled machine tools and also modern computer-aided manufacturing systems are being employed in the analysis and simulation of technological processes. The development of technology enables monitoring of particular stages of the technological process, inspection of the technical conditions of technological machines and devices and control of the production cycle of machine elements. It is also possible to check the manufacturing accuracy (product dimensions, shape and surface quality), evaluate the quality of materials used for the manufacturing of particular machine elements, evaluate and test the final products, and also test the durability and reliability of machines and devices.

Contact Person: Doc dr Milan Rackov

Period of realization: 2015 - 2016

ID: CIII-PL-0033-11-1516



9. Engineering as Communication Language in Europe

Description: The prolong of Network “Engineering as Communication Language in Europe” is a continuation of successful cooperation between Universities on the base of Network PL-0701 which was established in 2012. There many native languages in Europe however, very often engineers use their own slang, which is quite well understandable to them, regardless of their nationality. I have noticed, that technical tutorials, brochures or other documents which are written in technical English can by understood by people, who have only basic knowledge of English. The goal of the new CEEPUS Network “Engineering as Communication Language in Europe” is to create communication and cooperation between engineers dealing with various engineering branches, thanks to what we would be able to create Interdisciplinary Engineering Teams. A strong background in engineer techniques applicable to a wide variety of complex problems is in demand along with engineers who understand more than one discipline and are prepared to work at the intersection of two or more engineering and science disciplines. Nowadays research and industry sectors have high requirements towards engineers. Often a single engineer is not able to solve complicated interdisciplinary problems, but there is a great possibility that Interdisciplinary Engineering Teams would make it better and faster. We would like to involve teachers from partner Institutions in order to create team projects that would be main part of the program. We would also like students to take benefit from our Program. Thanks to it, students would be able to freely communicate and work - communicating with their supervisors e.g. during trainings, summer schools, excursions, etc. "Engineering as Communication Language in Europe" gives the opportunity to create successful cooperation not only between teachers but also students from the universities which are to participate in the network, as well as between beneficiaries of the freemover mobility. Teacher and student mobility within this network enables learning and research experiences exchange within related fields, helps to build personal connections, broaden professional horizons and what is more, gives the opportunity to develop the curricula.

Contact Person: Doc dr Borislav Savkovic

Period of realization: 2015 - 2016

ID: CIII-PL-0033-11-1516



10. Teaching and research in advanced manufacturing

Description: This network aims to contribute to the objectives of the Europe 2020 Strategy, by develop strategies and partnerships considering that a comprehensive internationalization strategy should cover key areas grouped into the following three categories: 1. international student and staff mobility; 2. the internationalization and improvement of curricula and digital learning; 3. strategic cooperation, partnerships and capacity building. These categories should not be seen as isolated but as integrated elements of a comprehensive strategy, which can be subordinated to the Salzburg Principles and the Salzburg II Recommendations of the European University Association (EUA). Of course, the comprehensive internationalization strategies will only be successful if they are the result of a collaborative effort of all participants into the framework of this network. Mobility brings manifold benefits to the institution and individual. It is an instrument for increase the international experience, the acquisition of new competences, languages and teaching methods. Mobility, and in particular credit mobility, should be used as a strong incentive for improving the quality of European higher education. Considering that mobility is always limited to a relatively small percentage of the student and teachers, our CEEPUS network must increasingly focus on the integration of a global dimension in the design and content of all curricula and teaching/learning processes. Digital learning and the widening use of ICT technology can open up the curriculum to knowledge, materials and teaching methods, fostering new forms of partnerships, exchanges across disciplines and faculties that would otherwise be difficult to establish. Increased openness and access through technology will improve competition and transparency, and allow to adjust teaching methods and materials to the needs of students who will work in a globalised labor market. Evidence shows that Joint and double degrees are powerful tools: to promote quality assurance and mutual recognition of qualifications; to attract talent and deepen partnerships; and to enhance the international experience, intercultural competence and employability of graduates.

Contact Person: Prof. dr Milenko Sekulic

Period of realization: 2015 - 2016

ID: CIII-RO-0013-11-1516



11. Design, implementation and use of joint programs regarding quality in Manufacturing Engineering

Description: "The world is changing and becoming increasingly smaller as the technology and allow free movement for people to be interconnected in any corner of the world through GLOBALIZATION. The next target is the globalization of higher education. More specifically, it is about the internationalization of QUALITY ASSURANCE in higher education." Steve O. Michael, Rector of Arcadia University, Philadelphia, USA. Global world brings global problems in Quality in Manufacturing Engineering. Economic pressures urge manufacturers to make more customized products of high quality, in smaller series, with shorter lead time and of course, without increased costs. Time is becoming rapidly the most strategic topic of companies. Costs are also important, more important are competitive price and the most significant are marketability of manufactured products. Therefore producers look for tools to increasing a competitive advantage of enterprises. Naturally the universities have to know to respond on global problems and to be prepared to educate the specialist. The new methods of Manufacturing Engineering, Rapid Prototyping, Rapid Machining and Virtual Prototyping are indeed strong tools for solving the global problems. Such as the production is global also education has global dimension. New forms of education such as e-learning give good possibility to extend collaboration among universities. All activities concerning the "e" (electronic) are keys for solving of global problems of producers and global problems of universities. Except global problem in education it is needful to solve legislative frame of common interest. Joint programs give a good platform for increasing of collaborated universities. Therefore the subject of new CEEPUS network is titled "Design, implementation and use of joint programs regarding Quality in Manufacturing Engineering". The main goal is the elaboration and implementation of Joint programs in study area of Manufacturing Engineering and Quality in Manufacturing Engineering.

Contact Person: Ivan Sovilj Nikic

Period of realization: 2015 - 2016

ID: CIII-RO-0058-08-1516



12. Implementation and utilization of e-learning systems in study area of Production Engineering in Central European region

Description: Introduction-Motivation: "Globalization, new technologies and demographic developments constitute an enormous challenge; one of the answers to this problem is the access to lifelong learning."(Ján Figel European Commissioner for Education, Training & Culture, 2004-2009) Access to lifelong learning can be solve using the e-learning systems. Information and communication technologies (ICT), properly used, contribute to the quality of education and training and to Europe's move to a knowledge-based society. The universities have to know to respond on global problems and to be prepared to educate the specialist. Many of the new methods used in production engineering and in CA systems and technologies as rapid machining, virtual prototyping, CAD/CAM/CAE/CMMS are based on "e" (electronic) activities because reduce the time (time is becoming rapidly the most strategic topic of companies) and increase the quality of products without increasing the costs. E-learning comprises all forms of electronically supported learning and teaching. E-learning applications and processes include Web-based learning, computer-based learning, virtual classroom opportunities and digital collaboration. The main action lines of the e-learning systems in study area of production engineering are based on

- Information and Communication Technologies (ICT):
- Digital literacy as e-books, e-papers, e-courses, etc.
- The teaching process must be based on e-presentations (slide-shows, paper show system, etc.).
- Development of virtual laboratories especially in case of equipment's with large dimensions.
- Development of simulations for improves the functions parameters.
- Using the virtual tests for find the possible errors in design.
- Using the simulations for improve the maintenance and reliability of machines and equipment's.
- Implementation of virtual laboratories specific for each University and realization of virtual laboratory network between Universities.

Contact Person: Doc. Dr Aco Antić

Period of realization: 2015 - 2016

ID: CIII-RO-0202-09-1516



13. Intelligent Automation for Competitive Advantage

Description: The original objective was the reduction in direct labour costs. But now other reasons are more prominent (uniform quality, safety, efficiency, etc.). Today, IntACA partners are turning to the human size of manufacturing automation, seeking for "out of the box" approach in establishing better quality of life. Products currently available on the market are so complex, that they are developed very often by the number of cooperating multidisciplinary design teams in different countries. Such characteristics of the product development necessitate the exchange not only information about the products but also the knowledge about the projects and particular design phases, including the specifications, design rules as well as knowledge acquired during the previous projects. The knowledge is often distributed across the boundaries of the company. The complexity of products and the distribution of the design teams enforce the use of the new software tools covering more development phases. To prepare the students for the work in a geographically distributed environment, the modification of the existing study programs is necessary. The students must also familiarize with the PLM/PDM software used for the execution of such works. Intelligent automation products and technology add value for users by applying advanced technology solutions to complex problems that increase machinery availability, reduce operating costs and improve safety, together with bringing back man to the central stage of production purpose. High quality education is the crucial factor in these intentions. Aims of the IntACA network The main aim of the network is to share and divide the knowledge and experiences in the different fields for both, educational and research purposes, to improve the cooperation between partner institutions with joining use of laboratory equipment of partner institutions (learning special techniques which are not available at the home institutions) and to improve the quality of lectures by means of intensive cooperation on development of joint courses, course materials and distance learning courses on English language.

Contact Person: Doc. Dr Bojan Lalić

Period of realization: 2015 - 2016

ID: CIII-RS-0065-10-1516



14. Technical Characteristics Researching of Modern Products in Machine Industry (Machine Design, Fluid Technics and Calculations) with the Purpose of Improvement Their Market Characteristics and Better Placement on the Market

Description: Market globalization has affected on product assortment extension on the market, which brought many benefits to the consumers. They are enabled to buy products of different quality, price, design and terms of delivery. Major manufacturers have received globalization with a great pleasure, because globalization enabled them expansion of the market and all the preferences that follow with this. Small and medium manufacturers are the most affected with globalization, because of presence of concurrents, so they can't place their products anymore in such amount like before, or even they can't do it at all. Due to globalization, they had to reduce their assortment and intensively to develop existent products, so they could become more competitive. All who didn't succeed this, had to change their production program, or simply to close their factories. Global world brings global problems in industrial production. Economic pressure urges producers to make more customized products of high quality, in smaller series, with shorter lead time and of course, without increased costs. Time is becoming one of the most important point of the companies strategy. Costs are also important. More important is competitive price and the most significant are marketability of manufactured products. Therefore, producers look for different ways (new design, modern tools, etc.) to increase a competitive advantage of their products. In most of the cases, leading concurrents bought all perspective companies (their potential concurrents), so they continued to produce, but, after this, different products. So, if small and medium manufacturers want to stay on globalized market, they intensively and incessantly must develop their products, apply new technologies and nourish aggressive marketing, because it is the only way to subsist at the market.

Contact Person: Prof. dr Siniša Kuzmanović

Period of realization: 2015 - 2016

ID: CIII-RS-0304-08-1516



15. Research and Education in the Field of Graphic Engineering and Design

Description: The graphic industry in the developed world takes a high profit place and its products greatly influence the other industry product marketing. It has a special importance in the economies of developing countries with a large number of small and medium enterprises. The particular place belongs to the packaging because it presents product to the customers and it is one of the most important deciding factor when buying is in a question. This project mainly aims to form proper network through which the advance of the knowledge will be enabled and significantly improved. The improvements will have a basis in constant research and knowledge along with modern programming tools and systems. Key research will include the important areas of graphic engineering and design. The basic research will include the field of design, prepress, press, postpress and packaging. Research in the field of design will include graphic product and industrial design in a correlation with prepress, press and postpress demands. Photography, typography and realization of multimedia contents will be also the objectives of the research. Important focus is going to be put on the type design of different lettering (e.g., Latin, Cyrillic) and a various number of a critical marks. Impact of different materials used for enhancement of printed images, like special and UV pigments, will be investigated. In recent years there is increasingly significant research in this field in order to achieve visually attractive products in graphic industry. Determination of achieved value of gloss and colour range will help solving the problem of revisualisation of products in the design face. Special attention will be paid to the market trends in terms of current requests concerning visual identity and production ability. Prepress activities will consist of defining the proper software for image processing, vector based pictures processing and final layout. Also, the research will be addressed to usual problems from the graphic industry with printing plates for different printing techniques and possible improvements in every day usage.

Contact Person: Doc. Dr Živko Pavlović

Period of realization: 2015 - 2016

ID: CIII-RS-0704-04-1516



16. Fostering sustainable partnership between academia and industry in improving applicability of logistics thinking (FINALIST)

Description: Supply chain management is a fact of business, with logistics as a most powerful tool for achieving ultimate strategic advantage. Today's business is constantly changing and evolving in response to change in technology, social and economic environments, and climate. Changes in business models drive a "new" supply chains. That novelty could be described through several major characteristics: (1) supply chain role has moved from being tactical to being strategic; (2) supply chain complexity and dynamics are constantly growing; (3) supply chain completely focuses on value from customers' point of view. Hence, new paradigms in business evolve new logistics and supply chain management strategies. To understand and apply those new logistics thinking, appropriate way of dissemination of logistics knowledge to future and current employees should be created. Hence, the overall objective of this project is to promote the innovation and implementation of sustainable knowledge transfer between academia and industry, with the final aim to improve regional logistics competence through better applicability of logistics thinking. Long program description Dynamics of market changes dictated by globalization, liberalization and constant technological development places the effectiveness of logistics and supply chain in the centre of economic success and competitiveness of a country or region. Logistics effectiveness is based on the appropriate level of excellence regarding logistics infrastructure, applied logistics practices and technologies, logistics culture and logistics competence. Logistics competence implies understanding of new strategic role of logistics activities in contemporary strategies for supply chains management. Understanding and application of the principle of contemporary logistics management requires creation of appropriate dissemination of new logistics knowledge among future and at the moment employed logisticians (creation of logistics human capital).

Contact Person: Doc. Dr Marinko Maslarić

Period of realization: 2015 - 2016

ID: CIII-RS-1011-01-1516



17. Building Knowledge and Experience Exchange in CFD

Description: The known fact is that beside costs, time is one of the most important aspects of one company's strategy. More important is competitive price and the most significant is marketability of product. Therefore companies look for tools that could increase a competitive advantage of their enterprises. One of these tools is computational fluid dynamics (CFD) which could reduce the development costs of many different products like devices, machines, systems etc. Computational fluid dynamics (CFD) already significantly replaces experiments in the many engineering fields: fluid mechanics, mechanics, thermodynamics, heat transfer, mass transfer etc. The reason for this is that the application of CFD reduces development costs of different products compare to experimental development. Due to lower costs there is a trend at the universities and development centers of large companies to reduce the share of experiment and increase the share of CFD application. Because of reduction of development costs of products, recently CFD is experiencing intense development and it is becoming the topic of many research projects around the world. Leading world universities already established CFD laboratories and study programs with subjects which deal with CFD. Many of these universities even issue diplomas of computational fluid dynamics engineer. This is reason why seventeen universities from eleven countries of Central and South-East Europe region suggest establishing of new network with title "Building Knowledge and Experience Exchange in CFD". Proposed network would bring many benefits to partners universities: establishing contacts between scientists who deal with CFD; exchanging information, knowledge and experience in the field of CFD; participating to the common research projects and other activities; assisting with work on M.Sc. and Ph.D. thesis in the field of CFD; organizing lectures, seminars, summer courses, schools, scientific conferences and workshops.

Contact Person: Doc. Dr Siniša Bikić

Period of realization: 2015 - 2016

ID: CIII-RS-1012-01-1516



18. Architecture Landscape Interiors Culture Emotions

Description: The most important focus of the platform is on its interdisciplinarity, joining different fields of art and design - interior design, product design, industrial design, textile and fashion design, graphic design, visual communications, illustration, etc. In the academic year 2013/2014 the platform consists of ten full partners and one silent partner: Full partners Faculty of Design in Ljubljana, an independent institution of higher education University of Split, Academy of Arts University in Sarajevo, Academy of Fine Arts University of Zagreb, Faculty of Forestry, Wood technology Department Poznan University of Life Sciences, Department of Furniture Design Faculty of Natural Sciences and Engineering, Department of Textiles University of Belgrade, Faculty of Forestry, Department of Wood Processing Non-state Academy of Fine Arts, Belgrade Chisinau "Ion Creanga" State Pedagogical University from Republic of Moldova, Faculty of Fine Arts and Design University of Novi Sad, Faculty of Technical Sciences Silent partner Saint-Petersburg State University of Technology and Design, Russia The principal goals of the platform consist of: - establishing a network of stable, reliable partners with common fields of study, goals, problems and topics in question; - the exchange of knowledge – sharing good practices, presenting different teaching approaches and new professional knowledge; - offering to all participating partners the possibility to partake in an international student project related to a chosen topic; - organising biannual student project competition related to a chosen group topic; - organising biannual scientific conference to exchange ideas, share problems, present new concepts, etc.; - publishing a catalogue of the student projects presented and selected by the international jury committee; and/or a catalogue of scientific papers presented at the scientific conference; - organising a biannual exhibition along with the award giving ceremony for the best project from each participating institution; - to prepare a joint MA programme between three/four partner institutions.

Contact Person: Doc. Dr Živko Pavlović

Period of realization: 2015 - 2016

ID: CIII-SI-0719-04-1516



19. From preparation to Development, implementation and utilization of Joint Programs in study area of Production Engineering

Description: Global world brings global problems in production engineering. Economic pressures urge manufacturers to make more customized products of high quality, in smaller series, with shorter lead time and of course, without increased costs. Time is becoming rapidly the most strategic topic of companies. Costs are also important, more important are competitive price and the most significant are marketability of manufactured products. Therefore producers look for tools to increasing a competitive advantage of enterprises. Naturally the universities have to know to respond on global problems and to be prepared to educate the specialist. The new methods of production engineering, CA systems and technologies, Rapid machining, Virtual prototyping are indeed strong tools for solving the global problems. Such as the production is global also education has global dimension. New forms of education such as e-learning give good possibility to extend collaboration among universities. All activities concerning the “e” (electronic) are keys for solving of global problems of producers and global problems of universities. Except global problem in education it is needful to solve legislative frame of common interest. Joint programs give a good platform for increasing of collaborated universities. Therefore the subject of new CEEPUS network is titled “From preparation to Development, implementation and utilisation of Joint Programs in study area of Production Engineering – contribution to higher flexibility , ability and mobility of students in the Central and East European region“. The principal motive is elaboration and implementation Joint programs in study area of Production engineering. All presented activities / organizing of conferences and workshops, seminaries for students and PhD students, support for elaboration and finishing of PhD thesis, excursion/ will be henceforward supported and will be effort to increase their level in framework of Joint programs.

Contact Person: Doc. Dr Đorđe Vukelić

Period of realization: 2015 - 2016

ID: CIII-SK-0030-11-1516



20. Applied Economics and Management

Description: Based on the very positive feedback received from network partners and from new universities interested in joining the network, we found it effective to work out the proposal of prolongation. Thus, we are planning: - to continue and expand cooperation within the network with 23 universities and carry out coordinating network activities; - to enable undergraduate, graduate, doctoral and lecturer exchanges to facilitate the emphasis areas at the host institutions, with using the library and other available resources; - to organize and manage the work of experts' groups in applied economics and management (namely in the field of macroeconomics, merchandising and applied agri-sector economics); - to prepare, adapt and deliver common curricula and teaching materials to wider educational community in the field of managerial courses, agricultural economics, finance, marketing and business studies; - to share distance learning experience; - to maintain the developed international Master study program "Business Economics" offered by 5 universities of the network; however, because of legislation difficulties in partner countries and some personal changes in the management of partner institutions still the final version of the program not available – ongoing discussion how to adjust the program to make it accessible as much as possible; - to introduce PhD theses with CEEPUS partners as consultants; - based on the module cooperation within doctoral study program Economics and Management between the Slovak University of Agriculture in Nitra and Agricultural University in Cracow we plan to use CEEPUS mobilities in categories: doctoral mobilities and staff mobilities to support this kind of PhD program; - to promote freemover mobilities based on acceptance letters: the network will enable also universities out of the network to offer their English courses in the relevant field and thereby promote selected English Modules and involve them into the operating network; - providing practical experience as a part of international practical short term excursion introduced into the practice of university studies in the future, as an inevitable part of university studies.

Contact Person: Doc. Dr Slavica Mitrović

Period of realization: 2015 - 2016

ID: CIII-SK-0044-10-1516



21. Advances in Machining

Description: The Network SK 0067 had started its activities since September 2005. When ongoing this project main stress will be done on continual improvement in all planned activities as well as on promotion of high level technical education according to market demand. All partners included to the network have confirmed yearly their willingness to cooperate and all have endeavoured to fulfil objectives stated in project with larger or smaller success. Universities included in this project have long term cooperation each to other on various levels (education, research, personal contact). The main areas of cooperation were established during this network:

1. Team of teachers actively and regularly have lectures in participating institutions as a part of regular education
2. Yearly scientific workshop is held in CUT for PhD and Master students with the participation of teachers
3. Courses in English for MSc students at TUKE
4. Excursion for students started in academic last academic year Applied mobility, common seminars and workshops, assistance with master and PhD thesis, interest of students to study abroad and take a part on CEEPUS mobility, publishing of Research Report are the main outcomes of this cooperation. Every year of this project bring us towards to be more experienced in common tasks defined as project objectives.

Contact Person: Prof. dr Pavel Kovač

Period of realization: 2015 - 2016

ID: CIII-SK-0067-11-1516



22. Renewable energy sources

Description: Primary motivation for creation Network “Renewable Energy Resources” was based on the fact that in one of the most popular and important area of technical sciences – field of Renewable Energy Resources – there was no running Network. From that time till present days enlarge the number of participants 5 times and each academic year there was big amount of student and teacher mobility. Preventing dangerous climate change is a strategic priority for the European Union. For 2020, the EU has committed to cutting its emissions to 20% below 1990 levels. This commitment is one of the headline targets of the Europe 2020 growth strategy and is being implemented through a package of binding legislation. Moreover, EU leaders agreed on 23 October 2014 policy framework for climate and energy, as proposed by the European Commission in January 2014. This 2030 policy framework aims to make the European Union's economy and energy system more competitive, secure and sustainable and also sets a target of at least 27% for renewable energy and energy savings by 2030. From this point of view the main aim of the CEEPUS network “Renewable energy sources” for 2015/16 is to continue in the development of strong partnership where participated universities work together not only in the frame of undergraduate, graduate and postgraduate students exchanges and teachers mobility, but they are involved in wide diapason problems concerning renewable or alternative energies and relevant science areas. We can describe the main objective of our CEEPUS Network as an effort to enhance quality of study and research in the field of “Renewable energy sources”.

Contact Person: Prof. dr Pavel Kovač

Period of realization: 2015 - 2016

ID: CIII-SK-0405-07-1516



23. The Urban Innovations Network

Description: The Urban Innovations Network is tended as an instrument to strengthen the cooperation between concerned partners from different countries in the eponymous subject of Urban Innovations those cover a framework of three different spheres of urban space. Namely its physical structure, social structure and functional structure. The main goal of this network is to establish an interface between those spheres and strategical documents such as territorial agenda and Leipzig Charter to contribute to the territorial cohesion through the academical cooperation program CEEPUS.

Therefore, the main targets in collaboration will focus on topics such as:

- Integrated urban development as a prerequisite for successful urban sustainability
- Strategies for upgrading the physical environment in deprived urban areas
- Strengthening the local economy and local labour market policy in deprived urban areas
- Proactive education and training policies on children and young people in deprived urban areas
- Sustainable urban transport
- Territorial cohesion

Programme operational objectives:

- To improve the quality and to increase the volume of mobility throughout the network area
- To improve the quality and to increase the volume of co-operation between partners of the Urban Innovations Network
- To facilitate the development of innovative practices in the field of education
- To improve the transparency and recognition of qualifications and competences
- To form joint degrees
- To encourage the learning of modern foreign languages

Contact Person: Doc. dr Milena Krklješ

Period of realization: 2015 - 2016

ID: CIII-SK-0606-05-1516



COST is the longest-running European framework supporting trans-national cooperation among researchers, engineers and scholars across Europe.

It is a unique means for them to jointly develop their own ideas and new initiatives across all fields in science and technology, including social sciences and humanities, through pan-European networking of nationally funded research activities. Based on a European intergovernmental framework for cooperation in science and technology, COST has been contributing - since its creation in 1971 - to closing the gap between science, policy makers and society throughout Europe and beyond. As a precursor of advanced multidisciplinary research, COST plays a very important role in building a European Research Area (ERA).

It anticipates and complements the activities of the EU Framework Programmes, constituting a “bridge” towards the scientific communities of COST Inclusiveness Target Countries. It also increases the mobility of researchers across Europe and fosters the establishment of scientific excellence.

The former science organization which was structured into nine science and technology domains has been replaced by a new organization aiming at guaranteeing a fully open and bottom-up approach through the establishment of a single Scientific Committee. This also includes a renewed evaluation and selection procedure aiming at identifying breakthrough ideas and favoring interdisciplinary and multidisciplinary projects.

1. Citizen Science to promote creativity, scientific literacy, and innovation throughout Europe

Description: The main aim of this Action is to bundle capacities across Europe to investigate and extend the impact of the scientific, educational, policy, and civic outcomes of citizen science with the stakeholders from all sectors concerned (e.g., policy makers, social innovators, citizens, cultural organizations, researchers, charities and NGOs), to gauge the potential of citizen science as enabler of social innovation and socio-ecological transition. The Action will explore the potential transformative power of citizen science for smart, inclusive, and sustainable ends, and will provide frameworks for the exploitation of the potential of European citizens for science and innovation. The relevance and timeliness of the Action derive from the recent explosion of activity around citizen science, as ordinary people and researchers begin to understand the power of technological devices which allow them to record the environment around them and share and collectively interpret data and knowledge to advance science and society.

Given the trans-disciplinarity of citizen science, the Action will benefit from the different contributions and perspectives from a range of disciplines and research cultures. As the latter rarely overlap and engage directly, the Action provides an ideal means for knowledge sharing and focused development on the topic by enabling better integration of separate national activities at a European and international scale.

Contact person: Doc. Dr Imre Lendak

Period of realization: 2016 – 2020

ID: CA COST Action CA15212

2. Adaptive Facades Network

Description: Multi-functional and adaptive building envelopes can provide step-change improvements in the energy efficiency and economic value of new and refurbished buildings, while improving the wellbeing of building occupants. They therefore represent a significant and viable contribution to meeting the EU 2020 targets. There is a critical mass of European knowledge, expertise, resources, and skills in the fields relevant to adaptive facades, but the research efforts across the multi-disciplinary topics and the wide range of novel technologies are scattered across several R&D centres in Europe. This Action aims to harness this knowledge and will thereby generate new ideas and concepts at a fundamental and product/system development level. This will be achieved by creating a research network with a strong multidisciplinary approach, involving academics, industrial partners from the facade supply chain, and other stakeholders. The COST Action will facilitate the sharing of experimental data, the development of modelling and simulation techniques, and the sharing of common evaluation methods. The work of this COST action is expected to form the basis for exploiting recent technological developments in adaptive facades and energy efficient buildings, and will help to train the future generation of facade R&D professionals in Europe.

Contact person: Doc. Dr Aleksandar Anđelković

Period of realization: 2014 – 2018

ID: TUD COST Action TU140

3. European network for shallow geothermal energy applications in buildings and infrastructures (GABI)

Description: The increased need for renewable energy sources has led to expansion of shallow geothermal applications for heating and/or cooling of buildings. The integration of heat exchangers in those elements of the structure that interface with the ground, such as foundations, tunnels and diaphragm walls, is particularly attractive because of the inherent cost saving involved in combining a required structural component with the harvesting of geothermal energy. Thermoactive geostructures present the additional benefit of relying on localized resources (the ground) and therefore do not need additional infrastructural investments. By providing an alternative to fossil fuels and reducing peak demand from the grid, they also provide an attractive tool towards energy independence and distributed generation with no adverse impact on the environment. However, the widespread application of this sustainable technology is currently hindered by the large heterogeneity in the development and regulatory framework in European countries.

By sharing knowledge and experiences, the use of thermoactive geostructures will increase, especially in countries with less experience. This newly created network will ensure an inclusive and open platform for scientific discussion to define European best practice rules for geothermal applications, promote public awareness and confidence in this technique, and foster advancement in knowledge through collaboration.

Contact person: Doc. Dr Aleksandar Anđelković

Period of realization: 2015 – 2019

ID: TUD COST Action TU1405

4. Overcoming Barriers to Nanofluids Market Uptake (NANOUP TAKE)

Description: Nanofluids are defined as fluids that contain nanometre-sized particles with enhanced heat transfer properties. Since 1995, active research on this topic has been conducted (more than 1,700 papers in the last 3 years). Nanofluids improve the efficiency of heat exchange and thermal energy storage systems and they are specifically mentioned in the Strategic Energy Technology Plan and the Materials Roadmap to enable Low-Carbon Technologies as potential elements to improve the efficiency of heat exchange and thermal energy storage systems. Consequently, nanofluids address the European Horizon 2020 Energy and Climate objectives (Societal Challenges 3: Secure, efficient and clean energy; and 6: Climate action, environment, resource efficiency and raw materials). In addition, nanofluids fall within one of the Key Enabling Technologies (KET) supported by the European Commission. Although some nanofluid commercial applications currently exist, most of the current nanofluids are at Technological Readiness Levels (TRL) 1 to 3. Most of the nanofluids research in COST countries has been conducted by Research, Development and Innovation (R+D+i) centres through national funding. Additional coordinated research and development efforts are required to develop nanofluids up to higher TRL levels and to overcome commercial application barriers. If these barriers are overcome, nanofluids will be an important player in the Value Added Materials (VAM) for the energy sector. The objective of the NANOUP TAKE COST Action is to create a Europe-wide network of leading R+D+i institutions, and of key industries, to develop and foster the use of nanofluids as advanced heat transfer/thermal storage materials to increase the efficiency of heat exchange and storage systems.

Contact person: Doc. Dr Siniša Bikić

Period of realization: 2016 – 2020

ID: CA COST Action CA15119

5. Fire safe use of bio-based building products

Description: Bio-based building products have a very long history, e.g. as timber structural members. Combustibility was the main reason why bio-based building materials were banned from many applications. When performance based design (PBD) became possible many building regulations opened the market for bio-based building products. However, large differences between regulations in countries exist and the use of combustible building products is still very limited.

Modern living offers attractive, flexible buildings and aims for cost efficient building techniques. Sustainability of building products became an issue. Consumers demand renewable products; however the Fire Safety of the end-product has to remain on a high level.

Fire Safety Engineering (FSE) has achieved large acceptance in the recent years. FSE allows a PBD with customized building solutions. However, the available techniques are often limited to non-combustible materials.

During the last decade the portfolio of building products made from bio-based raw materials has increased enormously. The material properties affecting a possible fire development vary which has been confirmed in many development projects including European researchers.

This Action wants to create a platform for networking, exchange and collection of performance data, experiences, authority- and climate requirements which affect the design with respect to the Fire Safe Use of Bio-based Building Products. By systematically organisation knowledge in this area will advance at a significant higher rate. The Action will Exchange researchers, organize Workshop and create comprehensive dissemination material.

Contact person: Prof. Dr Tanja Kočetov-Mišulić

Period of realization: 2014 – 2018

ID: FPS COST Action FP1404

6. Solutions for Critical Raw Materials Under Extreme Conditions (CRM-EXTREME)

Description: Difficulties in the access to critical raw materials (CRMs) are expected to depress industrial sectors vital to Europe.

The Action focuses on the substitution of CRMs (like Cr, Co, Nb, W, Y) in high value alloys and metal-matrix composites used under extreme conditions of temperature, loading, friction, wear, corrosion, in Energy, Transportation and Machinery manufacturing industries.

The Action aims to set up a network of expertise to define the state of knowledge and gaps in multi-scale modelling, synthesis, characterization, engineering design and recycling, that could find viable alternatives to CRMs and promote the industrial exploitation of substituted materials.

The Action envisions a fully Sustainable Value Chain approach for:

- Machinery manufacturing industry
- Alternatives for Co and W in WC/Co cemented carbide wear resistant tool materials (Hard Metals and Cutting Tools)
- Alternatives for chromium- and tungsten-alloyed tool steels
- Energy Industry
- Reduction of Cr and Y in high-strength steel alloys
- Alternatives for Cr and other CRMs by hard, wear and corrosion resistant surface coatings
- Transportation Industry
- Alternatives for Nb in high-strength low-alloy (HSLA) steel (Automotive)
- Alternatives for high-temperature Ni-based superalloys (Aerospace)

A four-year Action oriented to strengthen collaboration between active researchers working in the different areas of investigation involving CRMs, is the most suitable initiative to seed the initial catalytic nucleus of growth for EU excellence in strategic CRMs substitution.

Contact person: Doc. Dr Dragan Rajnović

Period of realization: 2016 – 2020

ID: CA COST Action CA15102

7. Random Network Coding and Designs over $GF(q)$

Description: Random network coding emerged through an award-winning paper by R. Koetter and F. Kschischang in 2008 and has since then opened a major research area in communication technology with widespread applications for communication networks like the internet, wireless communication systems, and cloud computing. It allows transmitting information through a network by disregarding any of its topological features. As in traditional algebraic coding theory, two main research directions in random network coding are

existence and construction of good and optimal network codes,

efficient encoding and decoding schemes for a given network code.

Restriction to the so-called Grassmannian codes has proven to be advantageous and leads to the theory of designs over $GF(q)$. Worldwide, there exists a larger number of workgroups focusing on this topic, which includes several groups located in Europe. This COST Action will set up a European research network and establish network coding as a European core area in communication technology. Its aim is to bring together experts from pure and applied mathematics, computer science, and electrical engineering, who are working in the areas of discrete mathematics, coding theory, information theory, and related fields.

Contact person: Prof. dr Dejan Vukobratović

Period of realization: 2012 – 2016

ID: ICT COST Action IC1104

8. Behavioural Types for Reliable Large-Scale Software Systems (BETTY)

Description: Modern society is increasingly dependent on large-scale software systems that are distributed, collaborative and communication-centred. Correctness and reliability of such systems depend on compatibility between components and services that are newly developed or may already exist. The consequences of failure are severe, including security breaches and unavailability of essential services. Current software development technology is not well suited to producing these large-scale systems, because of the lack of high-level structuring abstractions for complex communication behaviour.

This Action will use behavioural type theory as the basis for new foundations, programming languages, and software development methods for communication-intensive distributed systems. Behavioural type theory encompasses concepts such as interfaces, communication protocols, contracts, and choreography. As a unifying structural principle it will transform the theory and practice of distributed software development.

The significance of behavioural types has been recognised world-wide during the last five years. European researchers are internationally leading. There is an urgent need for European co-ordination to avoid duplication of effort, facilitate interactions among research groups, and ensure that the field proceeds efficiently from academic research to industrial practice. This Action will provide the co-ordination layer and leverage the efforts of European researchers, to increase the competitiveness of the European software industry.

Contact person: Prof. dr Jovanka Pantović

Period of realization: 2012 – 2016

ID: ICT COST Action IC1104

9. Colour and Space in Cultural Heritage (COSCH)

Description: True, precise and complete documentation of artefacts is essential for conservation and preservation of our cultural heritage (CH). By ensuring access to the best possible documentation of artefacts we are contributing to the enhanced understanding of material CH and help its long-term preservation. We are all responsible for ensuring that this heritage is passed on to future generations.

Documentation of CH involves researchers, scientists and professionals from multiple disciplines and industries. There is a need to promote research, development and application of non-contact optical measurement techniques (spectral and spatial), adapted to the needs of heritage documentation, on a concerted European level, in order to protect, preserve, analyse understand, model, virtually reproduce, document and publish important CH in Europe and beyond.

Research in this field typically relies on nationally-funded projects with little interaction between stakeholders. This Action will provide a stimulating framework for articulating and clarifying problems, sharing solutions and skills, standardising methodologies and protocols, encouraging a common understanding, widening applications and dissemination. The Action will foster open standards for state-of-the-art documentation of CH. It will simplify the usage of high-resolution optical techniques in CH and define good practice and stimulate research.

Contact person: Prof. dr Nataša Sladoje Matić

Period of realization: 2012 – 2016

ID: MPNS COST Action TD1201

10. Transactional Memories: Foundations, Algorithms, Tools, and Applications (Euro-TM)

Description: Parallel programming (PP) used to be an area once confined to a few niches, such as scientific and high-performance computing applications. However, with the proliferation of multicore processors, and the emergence of new, inherently parallel and distributed deployment platforms, such as those provided by cloud computing, parallel programming has definitely become a mainstream concern. Transactional Memories (TMs) answer the need to find a better programming model for PP, capable of boosting developers' productivity and allowing ordinary programmers to unleash the power of parallel and distributed architectures avoiding the pitfalls of manual, lock based synchronization. It is therefore no surprise that TM has been subject to intense research in the last years. This Action aims at consolidating European research on this important field, by coordinating the European research groups working on the development of complementary, interdisciplinary aspects of Transactional Memories, including theoretical foundations, algorithms, hardware and operating system support, language integration and development tools, and applications.

Contact person: Prof. dr Miroslav Popović

Period of realization: 2012 – 2016

ID: ICT COST Action IC1001

11. Active and intelligent fibre-based packaging - innovation and market introduction (ActInPak)

Description: Research and development of new fibre-based packaging materials with active and intelligent features have shown huge potential to optimise the supply chain, and increase the shelf-life of foodstuff and enhance consumer consciousness of food utilisation. Very few of the potential solutions have, however, been able to reach the market.

This Action aims to identify and focus on the key technical, social, economic and legislative factors relevant for a successful deployment of renewable fibre-based functional packaging solutions. This will be achieved by conducting research and development into active and intelligent packaging, encompassing both scientific and technical solutions, addressing the opportunities for, and obstacles to, market introduction. The innovative approach of this Action lies in the sharp focus on the integration of active and intelligent solutions in papermaking in order to create next-generation functional fibre-based packaging. The Action will achieve the objectives by providing an open multidisciplinary platform for the complete paper and board packaging value chain and aims at strong involvement of industrial partners throughout Europe. Sustainable fibre-based packaging materials with new and active functionalities may help to introduce new products on the market with higher value and profits for paper and board manufacturers than traditional products.

Contact person: Doc. Dr Nemanja Kašiković

Period of realization: 2015 – 2019

ID: FPS COST Action FP1405

12. Interdisciplinarity in research programming and funding cycles (INTREPID)

Description: This Actions will bring together communities of researchers, and research policy makers, contributing to advance our understanding and effective application of interdisciplinarity. A range of actions is designed to draw upon the Network's knowledge of barriers, as well as success and good practices, leading to the building of a critical mass of researchers and funders working to strengthen the European Research Area's capacity for interdisciplinarity.

Contact person: Doc. Dr Gojko Vladić

Period of realization: 2015 – 2019

ID: TD COST Action TD1408

13. The transfer of engineered nanomaterials from wastewater treatment & stormwater to rivers

Description: Concerning the transfer of Engineered Nanomaterials from wastewater Treatment & stormwater to Rivers (ENTER) the following issues require clarification: (i) which and (ii) what amounts of Engineered NanoMaterials (ENMs) are released, (iii) how persistent are they and (iv) to what extent do they cause in situ toxicity? Reasons for knowledge gaps are a lack of suitable analytical methods, insufficient databases on usage and release, and the absence of comprehensive monitoring networks. ENTER will help to advance scientific knowledge on release and fate of ENMs in the urban water cycle and to communicate expert knowledge in an appropriate manner to the non-scientific community. ENTER will break down barriers between scientific and public pressure groups by an intensified scientific exchange via, e.g., the position papers. The ENTER products are needed to improve the decision-making process by supporting end users such as politicians, the EU and national public servants. ENTER will clearly aid to advance the understanding on the transport and transformation processes of ENMs released to the urban wastewater systems and to understand the transfer of ENMs to the aquatic environment. This Action will improve the collaboration between scientists and the public by striking a new path towards an efficient knowledge exchange.

Contact person: Associate professor Dr Miljana Prica

Period of realization: 2013 – 2017

ID: ESSEM COST Action ES1205



Erasmus+

Erasmus+ Capacity-building projects in the field of higher education¹ build on the success of the former Alfa, Edu-link and Tempus programmes and aim to:

- Support the modernisation, accessibility and internationalisation of higher education in the Partner Countries;
- Promote cooperation between Programme Countries and eligible Partner Countries (as well as among eligible Partner Countries themselves);
- Promote voluntary convergence with EU developments in higher education;
- Promote people-to-people contacts, intercultural awareness and understanding.

Capacity-building projects in the field of higher education are transnational cooperation projects, based on multilateral partnerships, primarily between higher education institutions from Programme and eligible Partner Countries. Joint Projects operate at micro level and target higher education institutions in the eligible Partner Countries specifically.

They aim to modernise and reform higher education institutions through activities such as:

Developing new curricula or improving existing ones; Improving governance and management systems; Building relationships between higher education institutions and relevant socio-economic actors.

Structural projects operate at macro level and target national higher education systems and policies in the eligible Partner Countries. They involve activities such as:

Modernisation of policies, governance and management of higher education systems; Strengthening relations between higher education systems and the wider socio-economic environment.

Projects can involve, where relevant, NGOs, SMEs and any organisations in the field of higher education.



Erasmus+

1. Institutional framework for development of the third mission of universities in Serbia (IF4TM)

Description: The strategic objective: To establish an institutional framework for the third mission of universities in Serbia relating to innovation and knowledge transfer.

Specific objectives:

- Define the legal framework to support the development of the third mission of Serbian universities
- Develop and implement technology transfer and innovation, through the establishment of INNO platform at five universities, raising the level of technological readiness and student involvement in the development of creative ideas
- Develop and implement continual education to build capacity in the areas of entrepreneurship, innovation and intellectual property management
- Developing and implementing the social inclusion dimension of universities to encourage the creativity of young people, as well as unlocking and mobilizing resources for universities needs of companies and society.

Contact person: Prof. dr Goran Stojanović

Period of realization: 2015 – 2018

ID: ERASMUS+ KA2



Erasmus+

2. Western Balkan Academic Education Evolution and Professional's Sustainable Training for Spatial Data Infrastructures (BESTSDI)

Description: The project aims to improve the curriculum of partnership faculties by introducing the concept of Spatial Data Infrastructure (SDI), and e-government as well as the extended concepts such as smart cities, a single digital market, the smart environment based SDI, etc. Project activities (cases) will refer to the two groups of students, students whose primary specialization is management of geospatial data (eg. Geodesy and Geomatics) and students of other faculties who use the SDI concept, for example. spatial planners, students of forestry, geography, agriculture, etc.

One of the bottlenecks of the current SDI development and e-government in the Western Balkans region is the lack of qualified specialists for the establishment of SDI, as well as their use for different purposes, thus maximizing their potential value. National cartographic cadastral agencies and other institutions responsible for the implementation of a number of directives and programs of partner countries are not at the level of European standards in developing SDI. Students who graduate under the new program will contribute to faster development of these "weak" infrastructure.

Contact person: Prof. dr Miro Govedarica

Period of realization: 2015 – 2018

ID: ERASMUS+ KA2



Erasmus+

3. Students' Mobility Capacity Building in Higher Education in Ukraine and Serbia (MILETUS)

Description: Miletus is engaged in capacity building in the field of virtual, real and combined mobility program in Serbia and Turilli (the territory of Ukraine as recognized by international law) in higher education institutions. The creation of required documents at national and institutional level, Miletus will achieve the goal of improving employment opportunities Master graduates in companies that operate internationally and improve the quality of doctoral studies and research, and thereby makes its contribution to quality research in the partner countries.

Expected project results are:

- improved management of student mobility programs at the national and institutional levels
- framework for virtual, real and combined mobility program as a guide for future use (for higher education institutions that do not participate in the project)
- improved teaching methodology during mobility program
- a good foundation for learning for students who participate in mobility program
- easier access to mobility programs for students with disabilities
- enhanced employment opportunities for graduates and development of international skills
- a wider range of research cooperation for PhD students

Contact person: Prof. dr Goran Stojanović

Period of realization: 2016 – 2019

ID: ERASMUS+ KA2



Erasmus+

4. Modernising GEOdesy education in WEstern Balkan with focus on competences and learning outcomes (GEOWEB)

Description: Within the project envisages promotion of regional cooperation and integration between the geodetic educational institutions and other partners of the project participants. The program will provide curriculum development with a focus on achieving expertise and improving the learning of geodesy and geomatics, with a focus on improving the learning system in geodesy and geomatics at the partner universities. Organizing summer schools for teachers to exchange knowledge and expertise in the field of geodesy and geomatics. The result of the project will be the implementation of a mechanism for ensuring quality in education in order to acquire the expertise and the introduction of e-learning based on problem solving. In cooperation geodetic educational institutions and other partners will be realized improving existing GIS applications in the management and use of land, water and environmental protection. The project involved research groups in the field of geodesy and geomatics, with complementary expertise.

The result of the project will be the launch of new programs for Master studies of geodesy at selected partner universities. Within the project it is planned to introduce e-learning based on problem solving (Problem-Based Learning (PBL)). The project envisages the exchange of students and teachers between the EU and universities in the Western Balkans. Also, the project will affect the improvement of the learning system in geodesy at the partner universities In cooperation with other partners and institutions on the project.

Contact person: Prof. dr Miro Govedarica

Period of realization: 2016 – 2019

ID: ERASMUS+ KA2



Erasmus+

5. Development and implementation of system for performance evaluation for Serbian HEIs and system (PESHES)

Description: The project "Development and implementation of system for performance evaluation for Serbian HEIs and system - PESHES" has the general objective: Improving the management and functioning of institutions and systems of higher education in Serbia

The specific objectives are:

- Definition of indicators to measure the performance of high school institutions and systems in Serbia as a basis for value based management.
- Structuring and pilot implementation of a system for ranking institutions and study programs.

The link between the project application and action plan of the Strategy for development of education is reflected in the absolute correlation and connectivity goals of the project, work packages, activities and results with a set of implementation actions.

The wider objective of this project is the creation of a series of indicators that would be used for performance evaluation and ranking of study programs and higher education institutions and the entire education system. Based on a set of indicators would be defined the appropriate models and developed an information system that would support these objectives.

Contact person: Prof. dr Ivan Luković

Period of realization: 2015 – 2018

ID: ERASMUS+ KA2



Erasmus+

6. Knowledge FOR Resilient soCiEty (K-FORCE)

Description: Natural and man-made disasters - floods, landslides, earthquakes, storm winds, hail, drought, wild fires and building fires are on the rise in the last decades in the Western Balkans. Human casualties, extensive damages to the urban areas, negative impact on the environment and further weakening of the regional economy are amongst indicators of increasing vulnerability. Preliminary surveys, done by project partners in the project preparation phase, have shown that the shortage of skills. Knowledge and skills of the existing staff in this area (state administration, public institutions and companies) is based on the education acquired from other engineering disciplines. We have noticed very different levels of knowledge and skills, with many people learning on the job in an unstructured way. These competences, knowledge and skills are insufficient to solve the growing problems in the field of Disaster Risk Management and Fire Safety Engineering (DRM&FSE). Moreover, the lack of safety culture in society in general is notable.

Decision No 1313/2013/EU on a Union Civil Protection Mechanism, in view of the significant increase in the numbers and severity of natural and man-made disasters in recent years and in a situation where future disasters will be more extreme and more complex with far-reaching and longer-term consequences as a result, in particular, of climate change and the potential interaction between several natural and technological hazards, emphasize an integrated approach to disaster management as increasingly important. Prevention is of key importance for protection against disasters and requires further action as called for in the European Parliament Resolution (2010) entitled a "Community approach on the prevention of natural and manmade disasters".

Contact person: Prof. dr Vlastimir Radonjanin

Period of realization: 2016 – 2019

ID: ERASMUS+ KA2



The Seventh Framework Programme of the European Community for research, technological development and demonstration activities ([FP7](#)) ran from 2007 to 2013. It was structured around four Specific Programmes supporting transnational collaborative research, investigator-driven research, career development of individual researchers, as well as training and mobility, and enhancement of research capacities in Europe.

From the total budget of €55bn:

- 82% (€45bn) has been allocated in open calls in the four specific programmes (€28.7bn Cooperation, € 7.7bn Ideas, €4.8bn People, €3.8bn Capacities)
- 18% was allocated to Euratom, JRC direct actions, ITER, the Risk Sharing Finance Facility and administrative expenditure.

Horizon 2020, the successor research and innovation programme to FP7, runs from 2014 to 2020. Over the seven years, the programme will make available €77 billion in funding for research and innovation, an almost 40% increase on FP7 in current prices.



1. An international network of 50 CubeSats for multi-point, in-situ measurements in the lower thermosphere and re-entry research - QB50

Description: The QB50 project will demonstrate the possibility of launching a network of 50 CubeSats built by CubeSat teams all over the world to perform first-class science and in-orbit demonstration in the largely unexplored lower thermosphere. Space agencies are not pursuing a multi-spacecraft network for in-situ measurements in the lower thermosphere because the cost of a network of 50 satellites built to industrial standards would be very high and not justifiable in view of the limited orbital lifetime. No atmospheric network mission for in-situ measurements has been carried out in the past or is planned for the future. A network of satellites for in-situ measurements in the lower thermosphere can only be realised by using very low-cost satellites, and CubeSats are the only realistic option. The Project will demonstrate the sustained availability of a low-cost launch opportunities, for launching small payloads into low-Earth orbit; these could be microsattelites or networks of CubeSats or nanosats or many individual small satellites for scientific, technological, microgravity or biology research. The project will include the development of a deployment system for the deployment into orbit of a large number of single, double or triple CubeSats. Once the system is developed for QB50 it can be easily adapted to other missions.

Contact person: Prof. dr Vojin Šenk

Period of realization: 2013 – 2016

ID: 284427-FP7-SPACE



2. Video Quality Driven Multimedia Streaming in Mobile Wireless Networks - QoSTREAM

Description: Robust and efficient multimedia transmission over wireless networks to mobile users is a challenging task due to large bandwidth consumption, quality of service (QoS) requirements, real-time and power constraints, heterogeneous receiver capabilities and error-prone wireless transmission environment. The necessity for seamless access and exchange of large amount of multimedia content anytime and anywhere by mobile users is driving intensive research within this field as it provides a number of business opportunities through commercial multimedia applications provisioning such as digital TV, video-on-demand, video conferencing, 3D TV, interactive gaming, social networking, etc. To address the ever-increasing consumers' requirements and ensure QoS, the emerging solutions for multimedia streaming over next generation wireless networks need to be adaptive to the specific conditions of the network and the receiver devices and take into account each individual user experience. Current state-of-the-art approaches in multimedia processing and communications are not driven by the quality of the users' experience and the project proposed is aimed at addressing this problem. The goal is to design a system that would be able to dynamically adjust the multimedia signal processing and communication parameters based on the appropriate video quality feedback provided by the receiver devices themselves, thus assuring optimal delivery for each specific configuration of the mobile wireless network.

Contact person: Prof. dr Dubravko Čulibrk

Period of realization: 2013 – 2016

ID: 295220 FP7-PEOPLE



3. Development of a Next generation European Inland Waterway Ship and logistics system - NEWS

Description: NEWS' principal objective is to increase (container) transport flows on inland waterways (especially the Danube) by developing a Next generation European Inland Waterway Ship and logistics system to make container transport on inland waterways more cost-, time- and ecologically efficient. Hence, it supports the full integration of waterborne transport into the EU transport and logistics chain.

Furthermore, NEWS aims at

- reducing ecological impact of container transport
- enabling unobstructed transport links across continental Europe by technically surpassing existing bottlenecks on the axis Rhine/Meuse-Main-Danube (by connecting the Black Sea Region to the North Sea Region, an extensive Trans-European impact will be achieved regarding traversed regions as the Danube Region)
- contributing to the "EU Strategy for the Danube Region's" aim to increase the cargo transport on the river by 20% by 2020 compared to the year 2010
- contributing to the development of ports in the Danube river basin into multimodal logistics centres and efficient multimodal terminals to connect inland waterways with rail and road transport by the year 2020

NEWS combines technical and logistical innovations to assist cross-border European challenges for an optimized container inland waterway transport

Contact person: Prof. dr Milosav Georgijević

Period of realization: 2013 – 2015

ID: 314005 FP7-TRANSPORT



4. Enhanced Multicarrier Techniques for Professional Ad-Hoc and Cell-Based Communications- EMPHATIC

Description: The goal of EMPHATIC is to develop, evaluate and demonstrate the capability of enhanced multicarrier techniques to make better use of the existing radio frequency bands in providing broadband data services in coexistence with narrowband legacy services. The project will address the Professional Mobile Radio (PMR) application, and in particular the evolution of the Public Protection & Disaster Relief (PPDR) service currently using TETRA or other legacy systems for voice and low-speed data services. Both cell-based and ad-hoc networking solutions are needed for PPDR and will be developed.

Our main emphasis is on filterbank based multicarrier (FB-MC) and single-carrier (FB-SC) waveforms for utilizing effectively the available fragmented spectrum in such heterogeneous environments. The core idea is to develop a multi-mode radio platform, based on variable filter-bank processing, which is able to perform modulation/detection functions simultaneously for different signal formats with adjustable centre frequencies, bandwidths and subchannel spacings. SC-FDMA waveforms are included in the study in order to relax the transmitter power amplifier requirements of mobile terminals. Enhanced OFDM solutions are also considered as alternatives aiming at minimal modifications to the 3GPP LTE standard, which serves as the reference system in the studies. In addition to physical layer functionalities, the project also develops MIMO and MAC-layer techniques, as well as relay networking solutions which are compatible and maximize the benefits of the waveform level solutions.

Contact person: Prof. dr Veljko Malbaša

Period of realization: 2013 – 2015

ID: 318362 FP7-ICT



5. Low-cost and energy-efficient LTCC sensor/IR-UWB transceiver solutions for sustainable healthy environment - SENSEIVER

Description: More than six billion tons of gas pollutants are released to Earth's atmosphere due to fossil fuels combustion and other industrial processes. Therefore, pollution represents one of the greatest issues of today's world. Scientists are warning the public that, if the environment were to be continuously polluted in the same manner as during the past decades, we are about to face a disaster of immense proportions. Global warming is a serious issue, but, unfortunately, not the only one. Ocean acidification is continuously increasing as a consequence of the atmosphere's carbon-dioxide reacting with water. The fresh water availability significantly influences the quality of life and human health. If the soil is polluted by toxic chemicals, garbage or microorganisms – disease carriers, rain and melted snow bring that very same pollution to rivers, lakes and oceans, thus endangering water ecosystems. One of the utmost needs is to provide systematic environment monitoring in all three medium: soil, water and air. Furthermore, efficient sensors able to detect changes caused by the pollutant presence, a system interconnecting those sensors by enabling wireless information transfer among them are also needed. The development and design of such devices and systems represent the main topic and the task of the SENSEIVER project, which actually represents the platform for employment of both, early stage researchers (ESRs) and experienced researchers (ERs), their training and education in leading institutions of the six European countries.

Contact person: Prof. dr Goran Stojanović

Period of realization: 2011 – 2015

ID: 289481 FP7-PEOPLE



6. Embedded Computer Engineering Learning Platform – E2LP

Description: Embedded systems are the invisible electronics and corresponding software that bring intelligence to objects, processes and devices. The main challenge in engineering education for embedded systems at university level is a complex and multidisciplinary approach which includes understanding of various systems based on different technologies and system solution optimizations. The main idea behind the project is to provide a unified platform which will cover a complete process for embedded systems learning. A modular approach is considered for skills practice through supporting individualization in learning. This platform shall facilitate a novel development of universal approach in creative learning environment and knowledge management that encourage use of ICT. New learning model is challenging the education of engineers in embedded systems design through real-time experiments that stimulate curiosity with ultimate goal to support students to understand and construct their personal conceptual knowledge based on experiments. In addition to the technological approach, the use of cognitive theories on how people learn will help students to achieve a stronger and smarter adaptation of the subject. Applied methodology will be evaluated from the scientific point of view in parallel with the implementation in order to feedback results to the R&D. As a result, the proposed Embedded Computer Engineering Learning Platform will ensure a sufficient number of educated future engineers in Europe, capable of designing complex systems and maintaining a leadership in the area of embedded systems, thereby ensuring that our strongholds in automotive, avionics, industrial automation, mobile communications, telecoms and medical systems are able to develop.

Contact person: Prof. dr Miodrag Temerinac

Period of realization: 2011 – 2015

ID: 317882 FP7-PEOPLE



7. ADVanced communicAtions and iNformaTion processing in smArt Grid systEms – ADVANTAGE

Description: Smart Grid systems represent a significant new technology to provide more energy efficient power delivery systems that reduce carbon emissions and can handle a mix of energy sources from small scale renewable energy to large power stations. The design and implementation of the smart grid will be very complex, involving a large number of systems, layers and relationships. In order to make the infrastructure of smart grid systems work effectively, engineers need to be trained to have a detailed understanding of both power engineering and communications issues. Many related research projects to date involve either mainly power engineers or mainly communications/signal processing researchers, limiting the interaction and knowledge exchange between these two communities. However, smart grid engineers should be able to appreciate the power network that the smart grid is designed for and how to communicate and process data concerning the power grid, so that it can be controlled effectively. This ITN project is a major interdisciplinary project between both power and communications engineers to train the next generation of engineers and scientists that will lead the development of this technology both within Europe and Internationally.

Contact person: Prof. dr Dejan Vukobratović

Period of realization: 2014 – 2017

ID: 607774 FP7-PEOPLE-ITN



European Commission
TEMPUS

Tempus is a European Union programme designed to help the process of higher education reform in Partner Countries. It supports projects between the higher education sector in the EU and its 27 partner countries to facilitate university modernisation, mutual learning between regions and peoples and understanding between cultures.

The Programme promotes voluntary convergence with EU developments in the field of higher education deriving from the Lisbon agenda and the Bologna process.

Tempus partner regions are:

- Western Balkans
- Eastern Europe and Central Asia
- North Africa and the Middle East

The first Tempus programme lasted from 1990 until 1994. The programme was consolidated and renewed for the 1994-1998 and 1998-2000 periods and, again, for the 2000-2006 period. It has become customary to refer to these periods of the programme as “Tempus I”, “Tempus II”, “Tempus II bis” and “Tempus III”.



European Commission
TEMPUS

1. Mastering innovation in Serbia through development and implementation of interdisciplinary post-graduate curricula in innovation management (MAIN)

Description: The general objective of the project is to foster Serbian innovative capacity by modernizing Serbian HE system and providing sustainable source of high-quality human resources. The project will achieve this by developing and realizing interdisciplinary postgraduate curricula in the field of innovation management based on best practice from existing EU study programs and according to the Bologna requirements at Serbian HE.

The specific objectives are:

1. To develop and implement interdisciplinary PhD program in innovation management as a joint degree of 4 Serbian universities,
2. To develop and implement interdisciplinary master program in innovation management as a joint degree of 4 Serbian universities,
3. To develop and implement certified innovation management courses for industry professionals to enable career development and increase employability.

These objectives should be achieved through synergetic partnership of 3 Serbian public and 1 private university, 1 college of applied sciences, 6 organizations representing key Serbian stakeholders, 4 well known EU universities and 2 non-academic EU partners with extensive experience in dealing with innovation and curriculum development.

Contact person: Prof. dr Bojan Lalić

Period of realization: 2013 – 2017

ID: 544278-TEMPUS-1-2013-1-RS-TEMPUS-JPCR



European Commission
TEMPUS

2. Fostering students' entrepreneurship and open innovation in university-industry collaboration (iDEALab)

Description: The general objective of the project is to advance employment and self-employment potential of graduates from WBC and enhance innovativeness of companies by fostering students' entrepreneurship, creation of business start-ups and open innovation approach in collaboration between universities and enterprises. The project will achieve this by developing a co-creative and supportive environment - iDEA Lab network which will encourage and foster students' entrepreneurial intent and at the same time support open innovation approach.

Specific objectives are:

- To set up, equip and network co-creative centres (iDEA labs) to support students to generate, develop and commercialize their own innovative ideas through entrepreneurship and/or open innovation
- To foster student entrepreneurship and start-up creation at university settings by improving infrastructure, entrepreneurial culture and skills
- To introduce and implement open innovation as a new form of partnership among key stakeholders in knowledge triangle in WBC
- To revise and adapt curricula to include entrepreneurial skills and problem-based learning

The principal results will include: 6 iDEA labs and their network in WBC with trained staff; developed and realized trainings for students and companies, established regional Market for ideas, developed students' start-ups and open innovations with companies, revised and adapted curricula.

Contact person: Vladimir Todorović

Period of realization: 2013 – 2017

ID: 544373-TEMPUS-1-2013-1-RS-TEMPUS-JPHES



European Commission
TEMPUS

3. **Building Network of Remote Labs for strengthening university-secondary vocational schools collaboration (NERELA)**

Description: The wider objective of this project is to increase attractiveness of engineering education through innovative teaching methods as well as through the strengthening of university- secondary vocational schools collaboration.

Specific objectives, within the aforementioned wider one, include:

- To build cross-universities network of remote engineering laboratories in order to enhance engineering education at Serbian HE institutions
- To strengthen university-secondary vocational schools collaboration through secondary vocational schools teacher training in using resources of The Library of Remote Experiments
- To bring remote engineering experiments into secondary vocational school classrooms in order to promote engineering education attractiveness to prospective engineering students

The expected outputs and outcomes include:

- Conducted analysis of the state-of-the-art remote labs networks at EU universities
- Conducted analysis of remote experiments at partner universities
- Created Guidelines for techno-pedagogical requirements for the remote labs
- Built infrastructure for remote experimentation at partner universities
- Designed The LiReX library of remote experiments
- Developed a set of new remote engineering experiments at partner universities
- Approx. 180 secondary vocational schools teachers trained in using of remote experiments
- The NeReLa included into EU networks

Contact person: Prof. dr Dragan Šešlija

Period of realization: 2013 – 2016

ID: 543667-TEMPUS-1-2013-1-RS-TEMPUS



European Commission
TEMPUS

4. Modernization of WBC universities through strengthening of structures and services for knowledge transfer, research and innovation (WBCInno)

Description: The WBCInno project has an overarching aim to contribute to the modernization of WBC universities through the strengthening of their management structures/services for cooperation with the world of business in the areas of knowledge transfer, research and innovation. It has as its ultimate goal the creation of strong entrepreneurial universities and innovative regions. Five specific objectives of the project are:

1. To establish Regional University Innovation Platform (UIP) at 5 WBC universities for integration and focusing of innovation potential and for fostering technology transfer and commercialization
2. To reinforce existing and to establish new university structures/services in the areas of knowledge transfer, research and innovation, in line with UIP requirements
3. To support the development of Business Incubators and Science Technology Parks in the WBCs, through mobilizing university resources
4. To develop a methodology for innovation management and networking of different stakeholders from universities and businesses, utilising collaborative software platform/tools
5. To facilitate the creativity of young people and involvement of public/private stakeholders in all modernization processes based on the Triple Helix model of cooperation

The project was initiated as a result of identified needs of the WBC region and defined strategic directions of the region's development.

Contact person: Prof. dr Goran Stojanović

Period of realization: 2012 – 2015

ID: 530213-TEMPUS-1-2012-1-RS-TEMPUS



SWISS NATIONAL SCIENCE FOUNDATION

SCOPES (Scientific co-operation between Eastern Europe and Switzerland)

Research partnerships with Eastern Europe

The SCOPES programme of the SNSF and the SDC is aimed at research groups and institutions in Switzerland and Eastern Europe who would like to launch a research co-operation.

The SCOPES (Scientific Cooperation between Eastern Europe and Switzerland) programme will be discontinued at the end of the current programme phase (SCOPES 2013-2016). Other opportunities for collaboration with Eastern European research partners will be offered; however, the details have not yet been determined.



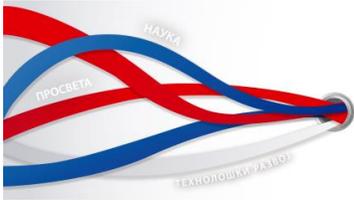
SWISS NATIONAL SCIENCE FOUNDATION

1. SCOPES Project on Speech Prosody – SP2

Description: The general aim of the joint project in terms of scientific research is to advance prosody extraction, processing and modeling by involving a large portfolio of European languages (English, French, German, Hungarian, Italian, Serbian, Macedonian) where beside Western languages, Central- and Eastern European languages are also represented. Detection of salient prosodic events and investigation of crosslingual transfer is also of interest. Salient events are especially frequent in conversational / spontaneous speech, the latter being an active research topic nowadays. This aim is similar to that of the SIWIS project, however, within the present context, experiments are extended to several new languages, like Slavic Serbian and Macedonian (Indo-European family) and FinnoUgrian Hungarian (the most spoken European language of non Indo-European origin). The goal is to advance conversational modeling, prosody modification techniques and crosslingual transfer of prosody. Another aspect assessed is prosody — and especially stress — prediction based on text. Although numerous approaches exist for this purpose, there is a lack of methods that would assign stress patterns to textual input obtained from human speech in a prosody transplantation way. For this task, it is needed to create new databases, as well as integrate available methods and advanced models of the stress patterns of human speech.

Contact person: Prof. dr Vlado Delić

Period of realization: 2014 – 2016



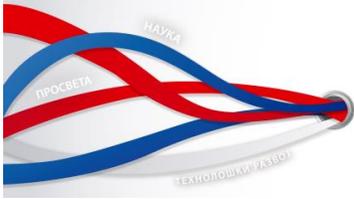
Министарство просвете,
науке и технолошког развоја



BILATERAL COOPERATION

Ministry of Education, Science and Technological Development contracts and financially supports projects of scientific and technological cooperation between domestic and foreign scientific and research organizations on the basis of international bilateral agreements.

In cases where the scientific and research organizations in such a way provide additional financial and material resources from abroad, the Ministry will proportionately, in accordance with the budgetary possibilities, provide our scientific and research organizations additional incentives.



Министарство просвете,
науке и технолошког развоја



SERBIA – PORTUGAL



1. Implementation of Internet of Things on Traceability Systems in Supply Chain of Food Production Industry

Contact person: Prof. dr Stevan Stankovski

Period of realization: 2015 – 2016

ID: 451-03-01765/2014-09/09



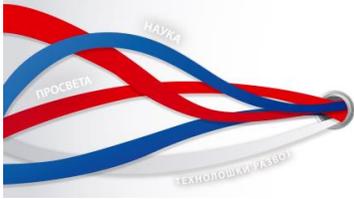
SERBIA – CHINA



2. Application of multi-sensor technology for obtaining integrated information system of traceability quality fresh food products in the cold chain

Contact person: Prof. dr Stevan Stankovski

Period of realization: 2015 – 2016



Министарство просвете,
науке и технолошког развоја



SERBIA – MONTENEGRO

3. Application of IoT technologies in order to increase the quality of identification and tracking of animals

Contact person: Prof. dr Stevan Stankovski

Period of realization: 2015 – 2016

4. Strengthening competitiveness in the stimulation of development of organic agriculture - a comparative study between Montenegro and Serbia

Contact person: Doc. Dr Slavica Mitrović

Period of realization: 2015 – 2016

5. Information system to support collaborative courier services in urban areas

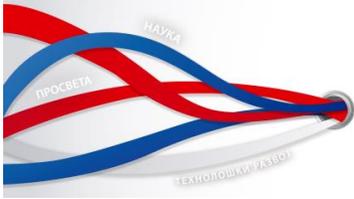
Contact person: Prof. dr Dubravko Ćulibrk

Period of realization: 2015 – 2016

6. Development and optimization of infrastructure for recharging electric and hybrid vehicles in urban and tourist areas in Serbia and Montenegro

Contact person: Prof. dr Vladimir Katić

Period of realization: 2015 – 2016



Министарство просвете,
науке и технолошког развоја



SERBIA - SLOVENIA

7. Fiber-optic sensor system for unauthorized localization downturn

Contact person: Prof. dr Miloš Živanov

Period of realization: 2015 – 2016

8. Thermoelectric materials based on the multi-layered structures

Contact person: dr. Milica Vučinić Vasić

Period of realization: 2015 – 2016

9. Security in Multiagent systems

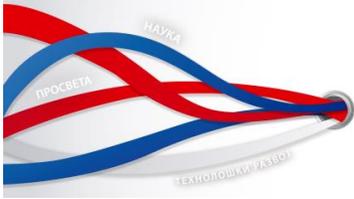
Contact person: Prof. dr Milan Vidaković

Period of realization: 2015 – 2016

10. Mechanisms binding aggregate made of ash, geopolimer and cement binders

Contact person: Prof. dr Miroslava Radeka

Period of realization: 2015 – 2016



Министарство просвете,
науке и технолошког развоја



11. Two-handed management of the physical interaction between humans and robots for use in rehabilitation and industry

Contact person: Doc. dr Mirko Raković

Period of realization: 2015 – 2016

12. Evaluation of uncertainty of measurement for coordinate measuring machines, and interlaboratory comparison

Contact person: Doc. dr Miodrag Hadžistević

Period of realization: 2015 – 2016



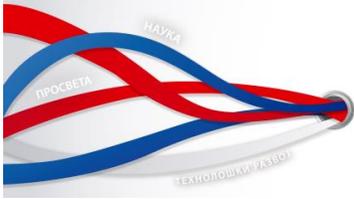
SERBIA - AUSTRIA

13. Development and evaluation of management scenario for bio waste in Serbia taking energy utilization and sustainable phosphorous management into account

Contact person: dr. Nemanja Stanisavljević

Period of realization: 2015 – 2016

ID: 451-03-01039/2015-09/13



Министарство просвете,
науке и технолошког развоја



SERBIA – CROATIA

14. Development of a model for assessing the energy efficiency of buildings in terms of sealing

Contact person: Prof. dr Vlastimir Radonjanin

Period of realization: 2015 – 2016



SERBIA - SLOVAKIA

15. Implementation of the Artificial intelligence into Optimisation of the Selected Advanced Removal Processes

Contact person: Prof. dr Pavel Kovač

Period of realization: 2015 – 2016