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UNIVERSITY OF NOVI SAD
FACULTY OF TECHNICAL SCIENCES

overview of

INTERNATIONAL PROJECTS

2020/2021

OVERVIEW OF

INTERNATIONAL PROJECTS

2020/2021

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OVERVIEW OF INTERNATIONAL PROJECTS

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Faculty of Technical Sciences
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OVERVIEW OF INTERNATIONAL PROJECTS

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Faculty of Technical Sciences
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CONTENTS

This year, the whole world has encountered new, obnoxious circumstances and conditions in which we work, live and study. At times, everything stopped. However, there is one drive that creates a better future and that never stops - science.

Science carries the burden on its shoulders to be the light when it is dark, to be warm when it is frost, to be safe while the ground is collapsing and to be courageous when fear reigns.

What lies at the core of the university's mission is comprehensive research. The Faculty of Technical Sciences is home to disciplines that are the drive for a better future and innovations developed through science. We are devoted to creating scientific researchers from two aspects – 'science at the service of science' and 'science at the service of the economy - applicable science'. We dedicate as a research development centre for many engineering disciplines, which implies searching for new applicable knowledge on all domains of learning from the engineering aspect.

Furthermore, the Faculty of Technical Sciences represents the foundation for continual advancements in sustainable entrepreneurship culture. Researches from the Faculty of Technical Sciences are committed to the creation of knowledge which will encourage systematic advancements in innovation ecosystems through knowledge from scientific research. Besides, with this year's work and results, we have shown how science can live in uncertain and unknown times, as Marie Curie said: "Nothing in this world should be feared, but only understood."

That is why this year we were even more committed in understanding and development.

We worked even harder on digitization and technological advancements.

This year, we celebrated sixty years since our founding. Faculty of Technical Sciences has many achievements to be proud of.

We gave such a great opportunity to our students, PhD students, assistants and young researchers to thrive more by opening the Science and Technology Park.

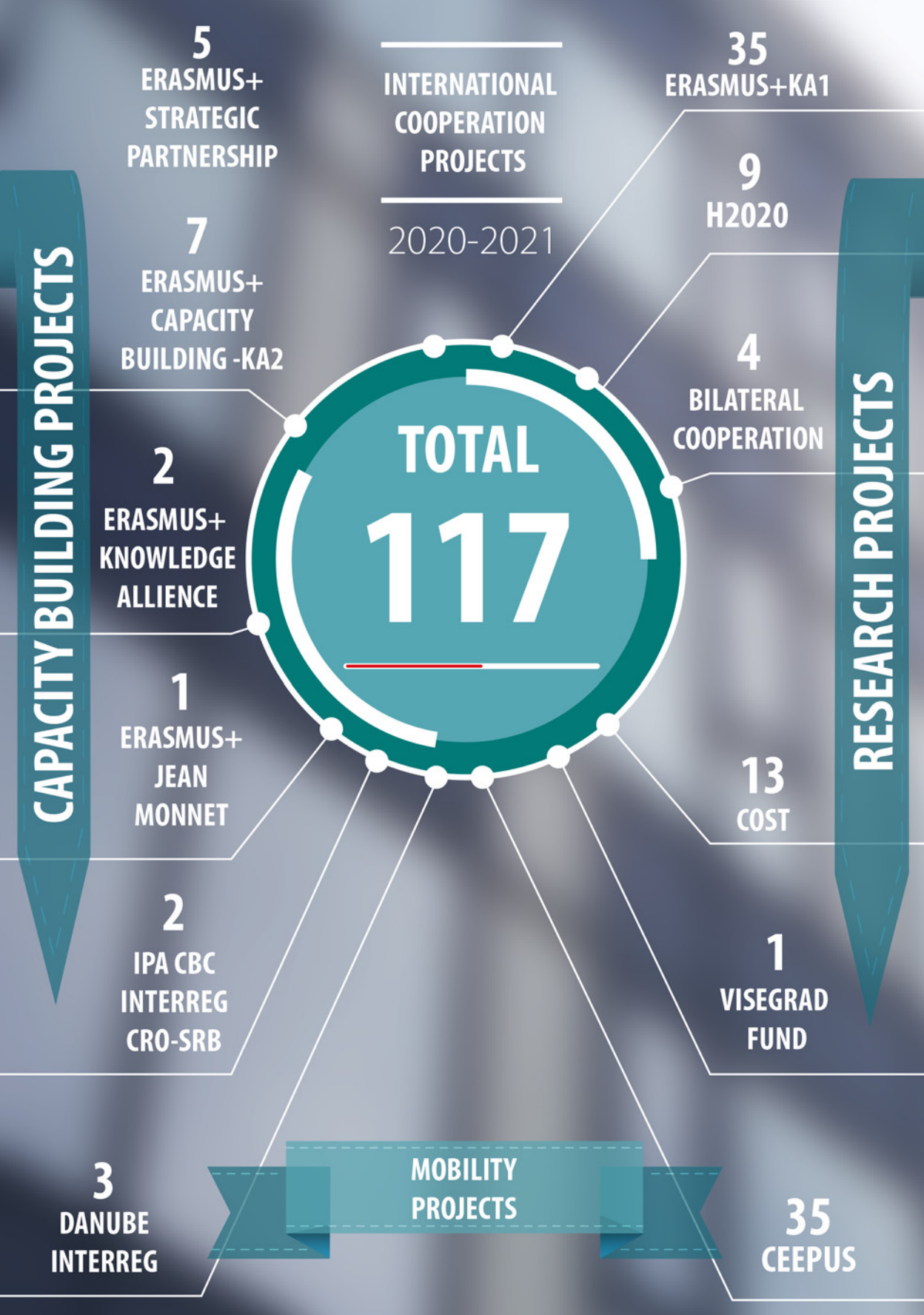
The Science and technology park is the foundation for even stronger cooperation between education, science and economy, the three essences of a better future.

The Faculty of Technical Sciences is the house of many engineering disciplines, always tending to be a safe place when the times of fear come by giving solutions and is steadily improving our reputation and competitiveness on the international stage.

The Faculty of Technical Sciences is proud to represent the current state in the field of international research that is being undertaken in our laboratories.

Prof. dr Darko Stefanović

Vice-dean for Science and International Cooperation


INTERNATIONAL COOPERATION PROJECTS
2020-2021
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CAPACITY BUILDING PROJECTS
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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.

Horizon 2020
European Union funding
for Research & Innovation

1. INnovation and excellence in massive-scale COMmunications and information processING

Description: Massive-scale data acquisition and information processing for large infrastructures, such as smart grids, smart transportation or smart industry, underpins the emerging fourth industrial revolution. 5G mobile networks and mobile edge computing (MEC) will provide communication and computation platform for such intelligent infrastructures to become a reality. Recognizing the need for expertise and leadership in this domain, with onward looking goal to support rapidly growing regional ICT sector, Faculty of Technical Sciences of the University of Novi Sad (Serbia) established the Centre for intelligent COmmunications, Networking and Information proCessing (ICONIC). ICONIC collects strong research team with a vision to become regional hotspot for 5G research and innovation, focusing on massive Machine-Type Communications, Large-Scale Distributed Information Processing, and Reconfigurable Hardware Design. INCOMING project (Innovation and excellence in massive-scale COMunications and information processING) lays out ambitious research-intensive and innovation-oriented plan to make the ICONIC centre regional 5G lighthouse by twinning it with Aalborg University (Denmark), Chalmers University of Technology (Sweden) and German Aerospace Centre (Germany). INCOMING will use staff exchanges, expert trainings, summer schools and workshops to boost the research excellence of ICONIC staff members focusing on ESRs. The twinning program will gradually shift focus from research to innovation-driven implementation of the promising research outcomes.

Contact person: Prof. dr Dejan Vukobratović
Period of realization: 2020 - 2022
ID: 856967-INCOMING-H2020-WIDESPREAD-2018-03
https://cordis.europa.eu/project/id/856967

Horizon 2020
European Union funding
for Research & Innovation

2. SMART4ALL - Selfsustained custoMized cyberphysicAl system expeRimenTs for capacity buiLding among European stakehoLders an intends to build a network of Digital Innovation Hubs (DIHs) across South and Eastern Europe

Description: SMART4ALL builds capacity amongst European stakeholders via the development of selfsustained, cross-border experiments that transfer knowledge and technology between academia and industry. It targets CLEC CPS and the IoT and combines a set of unique characteristics that join together under a common vision different cultures, different policies, different geographical areas and different application domains. SMART4ALL brings a new paradigm for revealing "hidden innovation treasures" from SEE and helping them to find the path to market via new, innovative commercial products. As part of its strategy, the project will develop and maintain an active network of DIHs across SEE for supporting academics, startups, SMEs, and mid-caps entering the digitization era. The mechanisms for achieving this are the design and implementation of 88 cross-border PAEs that will be executed by the consortium members and by 3rd party consortia (academics, companies and mid-caps). The latter will be supported via well-defined regular open calls and will have a day-by-day coaching by SMART4ALL consortium for boosting the research ideas to successful products. PAEs will be actively supported by SMART4ALL DIH cluster throughout and after their execution. The targeted application areas are domains that are not adequately represented in current SAE projects and include digitized environment, digitized agriculture, digitized anything and digitized transport.

Contact person: Doc. dr Boris Antić, Prof. dr Zoran Mitrović
Period of realization: 2020 – 2024
ID: *872614-H2020-DT-2018-2020*
https://esda-lab.gr/index.php/en/announcements-en-top/226-smart4all-the-new-european-project-of-esda-lab

Horizon 2020
European Union funding
for Research & Innovation

3. Innovative Network for Training in wAter and Food QUality monitoring using Autonomous SENSors and IntelligEnt Data Gathering and Analysis - AQUASENSE

Description: The deterioration of water quality, caused by climatic/seasonal changes, or industrial waste etc. is a major global concern. Over the last decade, water quality observing technology has risen to the challenge of scientists to identify and mitigate poor water quality by providing them with cost-effective tools that can take measurements of essential biogeochemical variables autonomously. Yet, despite these options becoming more readily available, there is a gap between the technology and the end-user (including the investigators and technicians that deploy these technologies) due to a collective lack of training, in-depth knowledge, and skilled workers who can meet new and emerging challenges. There is also a disconnect between data quality, data gathering by autonomous sensors and data analysis, which is a major obstacle, as the sensors are already being deployed (e.g. through buoys, boats etc.). AQUASENSE will address these challenges through 15 early stage researchers (ESRs), who will receive 540 person-month of unparalleled multidisciplinary training in the field of water quality monitoring. Each ESR will be mentored by carefully selected experts from academia and industry in 9 European countries (UK, Germany, Ireland, Serbia, Sweden, Italy, Poland, Austria, Estonia) and will have access to state-of-the-art equipment to develop autonomous sensors for improved data quality. The autonomous underwater robots and drones will be used to improve the data gathering and AI methods will be used to improve the data analysis.

Contact person: Prof. dr Goran Stojanović

Period of realization: 2018 – 2022

ID: *H2020-MSCA-ITN-2018- 813680*

https://cordis.europa.eu/project/id/813680

4."A multimodal AI-based toolbox and an interoperable health imaging repository for the empowerment of imaging analysis related to the diagnosis, prediction and follow-up of cancer", INCISIVE

Description: "The increasing amount and availability of collected data (cancer imaging) and the development of novel technological tools based on Artificial Intelligence (AI) and Machine Learning (ML), provide unprecedented opportunities for better cancer detection and classification, image optimization, radiation reduction, and clinical workflow enhancement. The INCISIVE project aims to address three major open challenges in order to explore the full potential of AI solutions in cancer imaging: (1) AI challenges unique to medical imaging, (2) Image labeling and annotation and (3) Data availability and sharing. In order to do that INCISIVE plans to develop and validate: (1) an AI-based toolbox that enhances the accuracy, specificity, sensitivity, interpretability and cost-effectiveness of existing cancer imaging methods, (2) an automated-ML based annotation mechanism to rapidly produce training data for machine learning research and (3) a pan-European repository federated repository of medical images, that will enable the secure donation and sharing of data in compliance with ethical, legal and privacy demands, increasing accessibility to datasets and enabling experimentation of AI-based solutions. The INCISIVE models and analytics will utilize various cancer imaging scans, biological data and EHRs, and will be trained with 1 PB of available data provided by 8 partners within the project. INCISIVE solution will be investigated in four validation studies for Breast, Prostate, Colorectal and Lung Cancer, taking place in 8 pilot sites, from 5 countries (Cyprus, Greece, Italy, Serbia and Spain), with participation of at least 2,600 patients and a total duration of 1.5 year. INCISIVE moves beyond the state of the art, by improving sensitivity and specificity of lower cost scanning methods, accurately predicting the tumor spread, evolution and relapse, enhancing interpretability of results and “democratizing” imaging data"

Contact person: Prof. dr Tatjana Lončar-Turukalo

Period of realization: 2020 – 2024
ID: H2020-SC1-FA-DTS-2019

Horizon 2020
European Union funding
for Research & Innovation

5. "Twinning for reaching sustainable scientific and technological excellence in the field of Green Electronics" – GREENELIT

Description: This project proposal aims at significantly strengthening research and innovation capacities of the University of Novi Sad (UNS), Serbia in the emerging field of Green Electronics by twinning action with EU internationally-leading research institutions – Italian Institute of Technology (IIT), Italy and Technical University of Denmark (DTU), Denmark. Through this project, networking gaps and deficiencies between the UNS and EU leaders will be decreased as well as RDI capacity of the involved institutions will be enhanced and staff's research profile will be improved. Green Electronics or Food-based electronics or electronic devices which can be consumed through the digestive system, provides solution for continuous monitoring of physiological parameters of the human body and represents alternative for invasive and painful approaches in conventional medicine. The GREENELIT work program envisages: (1) Sustainable linking for excellence - through transfer of knowledge and expertise during secondments, best practices will circulate between UNS and EU leading research institutions (IIT and DTU); (2) Raise research profile of the UNS and its staff - through delivering lectures by experts, short-term on-site training, organization of workshop/conference and strengthening the research management and administration unit at UNS; (3) Scientific strategy for stepping up in the field of Green Electronics - through benchmarking analysis and creating the Strategy and Action plan for its implementation; (4) Involvement of early stage researchers - focused on promotion of involvement of ESRs at UNS and improvement prospects of their career through training, mentoring and networking measures; (5) Dissemination and outreach activities - aimed to present the GREENELIT achievements to a wider community. This project will significantly support the UNS on the route to be a dynamic "innovation engine" capable of sustaining regional and national scientific, economic and social growth.

Contact person: Prof. dr Goran Stojanović

Period of realization: 2020 – 2023

ID: **H2020-WIDESPREAD-2020-5, no. 951747**

6. "Embedding RRI in Western Balkan Countries: Enhancement of Self-Sustaining R&I Ecosystems", WBC-RRI.NET

Description: "Although Western Balkan countries (WBCs) have improved in terms of R&I performance, research and innovation efforts should be further enhanced for bridging the remaining 'gap' with the rest European regions. RRI principles can act as enablers for the sustainable development of the local R&I systems, enhancing the effectiveness of R&I strategies contributing to the advancement of Western Balkan socio-economic progress in a transparent, open, and inclusive way through active participation of all quadruple helix actors. WBC-RRI.NET aims to foster the application of RRI principles at the territorial level in five (5) Western Balkan -4 region-level and 1 country-level- R&I ecosystems and promote a multi-level steering R&I governance framework in the WBCs. RRI principles will act as enablers to the shared learning and diffusion of R&I governance innovations at territorial level, enhancing R&I planning, including S3 Strategies in the WBCs. The project's approach evolving through an analytical, reflective and implementation thread will operationally address the 5 WB territories (partners represent all parts of the quadruple helix) and subsequently influence the wider WB region, by activating the embedding of RRI into their R&I ecosystems. This will be realised by RRI activities throughout the entire project (horizontal aspect), raising an active dialogue in the wider WB region and fostering the comprehension of all RRI pillars under a holistic framework based on a 'smart directionality' approach, offering stakeholder engagement with a focus on citizen participation. Alongside, 5 RRI 'anchor' initiatives (vertical aspect), as interventions touching in-depth specific RRI keys, territorial features and scientific domains, will allow RRI principles to be rooted in the territorial ecosystems leading to concrete impact to R&I territorial policies and societal regional needs. Finally, impact evaluation and dissemination activities focus on the project's long-term sustainability."

Contact person: Prof. dr Goran Stojanović

Period of realization: 2021 – 2024

ID: H2020-SWIFT-14-2018-2019-2020, no. 101006279

7. ERA Chair for emerging technologies and innovative research in Stretchable and Textile Electronics (STRENTEX)

Description: Wearable technology is set to supercharge the catwalk. Our clothes are becoming smarter with the integration of stretchable electronic circuits into textiles. The STRENTEX project's ERA Chair action aims to boost the research potential of the Faculty of Technical Sciences, University of Novi Sad (FTN) in Serbia. Building on a network of existing international, regional and national partners, as well as SMEs and stakeholders, the project will contribute to the development of patches to monitor health, sensors in baby slings, theranostic wound dressings and other similar products. A wider aim of the project is to strengthen the economy of Serbia and Europe. The motivation behind this Project is to create a point of excellence of the Faculty of Technical Sciences, University of Novi Sad (FTN), Novi Sad, Vojvodina, Serbia, to continuously advance state-of-the-art research, technological innovation and contribution to broader social goals, in the field of Stretchable and Textile Electronics. The Project is set in the framework of the ERA Chair action to simultaneously reinforce the research potentials of the FTN and to create cutting-edge dynamic and sustainable research environment. These products with a high future market potential, such as human monitoring patches, sensors in baby slings, theranostic dressings, will enable a move from "technology push" to "market pull" and will facilitate involvement of the ERA Chair into "Industry 4.0" revolution. STRENTEX project envisages the following activities: (1) ERA Chair establishment – ERA Chair holder appointment and employment of his/her team members; (2) Implementation of structural changes in FTN, for sustainable excellence; (3) Raising research profile of the FTN and its staff, thanks to ERA Chair; (4) Boosting FTN's innovative capacities and capabilities; (5) Dissemination, communication and exploitation activities. Thanks to this Project, disparities in terms of research and innovation performance between Serbia and innovation leaders in EU will be significantly decreased. Far-reaching effects of the STRENTEX will be creation of world-class working environment and favourable eco-system for flourishing centre of excellence and innovative start-up companies, strengthening of the Serbian and European economy.

Contact person: Prof. dr Goran Stojanović

Period of realization: 2020 – 2024

ID: H2020- WIDESPREAD-04-2019: ERA Chairs

Horizon 2020
European Union funding
for Research & Innovation

8. Multimodal Extreme Scale Data Analytics for Smart Cities Environments- MARVEL

Description: The "Smart City" paradigm aims to support new forms of monitoring and managing of urban resources as well as to provide situational awareness in decision-making to fulfill the objective of servicing the citizen, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental aspects. Considering the city as a complex and dynamic system which involves different interconnected spatial, social, economic, and physical processes subject to temporal changes and continually modified by human actions, Big Data, fog, and edge computing technologies have significant potential in various scenarios considering each city individual tactical strategy. However, one critical aspect is to encapsulate the complexity of a city and support accurate, cross-scale and in-time predictions based on the ubiquitous spatio-temporal data of high-volume, high-velocity and of high-variety. To address this challenge, MARVEL delivers a disruptive Edge-to-Fog-to-Cloud (E2F2C) ubiquitous computing framework that enables multimodal perception and intelligence for audio-visual scene recognition, event detection and situational awareness in a smart city environment. MARVEL aims to collect, analyse and data mine multimodal audio-visual streaming data of a Smart City and help decision makers improve the quality of life and services to the citizens without violating ethical and privacy limits in an AI-responsible manner. This is achieved via: (i) fusing large scale distributed multimodal audio-visual data in real-time; (ii) achieving fast time-to-insights; (iii) supporting automated decision making at all levels of the E2F2C stack; and iv) delivering a personalized federated learning approach, where joint multimodal representations and models are co-designed and improved continuously through privacy aware sharing of personalized fog and edge models of all interested parties, while performance of the deployed models and local ML adaptations are constantly monitored to achieve continuous system improvement and adaptation.

Contact person: Prof. dr Dragana Bajović

Period of realization: 2021 – 2023

ID: H2020- ICT-51-2020 Big data technologies and extreme-scale analytics

https://cordis.europa.eu/project/id/957337

Horizon 2020
European Union funding
for Research & Innovation

9. Voice controlled logistic system for automation in meat production- VCLMP

Description: The project involves the development of an advanced voice-controlled logistic system in an abattoir that enables monitoring of full traceability in meat production. Food safety and bioterrorism are some of the most challenging aspects of the world today. Obtaining full traceability in abattoirs is an extremely complex task. Our solution combines software and hardware components in order to build a sustainable solution that can be applied in different types of small and middle-size abattoirs as well as other types of similar production processes. It involves the cooperation of humans, direct commanding through voice controlling, AGV, NFC tags, and robot arms in order to achieve the highest level of food security and to prevent possible fraud by placing unsafe products in food chains. The entire process is implemented as a set of microservices and the OPIL platform will be used as a mechanism that will enable the integration of those services.

Contact person: Prof. dr Mirko Raković

Period of realization: 2020-2021

http://www.l4ms.eu/

Erasmus+ Strategic Partnerships

Strategic Partnerships are transnational projects designed to develop and share innovative practices and promote cooperation, peer learning, and exchanges of experiences in the fields of education, training, and youth.

Overall, strategic partnerships aim to address horizontal priorities as well as field specific priorities in the areas of:

- Higher education
- Vocational education and training
- School education
- Adult education, and
- Youth.

There are two kinds of Strategic Partnership; those supporting innovation and those supporting the exchange of good practices.

Strategic Partnerships provide opportunities for a wide variety of public, private, and non-governmental organisations to implement a broad range of activities including, for example:

- Strengthening cooperation and networking between organisations,
- Promoting the development, testing, and implementation of innovative practices,
- Promoting the recognition and validation of knowledge, skills, and competences,
- Promoting cooperation between regional authorities to develop new systems for education, training, and youth,
- Supporting education and training professionals to promote equity, diversity, and inclusion in learning.

1. Innovative Teaching Approaches in development of Software Designed Instrumentation and its application in real-time systems (ITASDI)

Description: This project is intended to establish a strategic partnership and enforce collaboration between project partner institutions among themselves and between project partner institutions and industry/economy factors. Project is intended to last for 13 months.

Since there is inconsistency in university study programs and demands of the industry/economy markets it was concluded that it is necessary to adapt study programs, namely courses, literature and web services to overcome this issue. As IT industry is one of the most growing economy markets we concluded that it is a final time to act in order to establish a firm foundation for all who practice real-time control systems, signal processing and virtual instrumentation design which are maybe a bit neglected, but also a valuable asset in IT industry.

The main objectives of the project include adapting study programs in project partner universities with collaboration with industry partners, uniforming courses syllabus in particular areas of interest as the needs of the local markets representing the project partners countries show similar behavior. Together with this, a new, modern teaching methodologies and approaches will be introduced, like new E-learning platform, video lectures from international partners, more interactive classes, work in groups (teaching assistants will behave as team leads), work on real life problems, student project implementation from scratch etc. Even the project management and implementation methodology has been introduced from IT management, so some approaches used in teaching will be also taken from IT industry, such as team work with team leads and specific division of tasks.

Contact person: Prof. dr Boris Jakovljević
Period of realization: 2018 – 2020
ID: 2018-1-RS01-KA203-000432

2. Triplex Confinium-Tackling Gaps and Mismatches in the Field of Higher Education for Architecture and Urban Planning while Exploring and Addressing Discontinuities along the National Borders in-between Romania, Hungary and Serbia (TC)

Description: Project addresses conditions in architecture education system related with other intersecting disciplines: anthropology, political science, social geography, digital tools. Project objectives are creation of transnational partnership between neighboring countries - Romania, Serbia and Hungary, with the aim of approaching shared problems regarding both higher education and regional development. Other outcome is increasing awareness of comune cultural heritage and the ways in which it can become a shared resource in bettering the lives of local communities.

Contact person: Prof. dr Bojan Tepavčević
Period of realization: 2019 - 2021
ID: *2019-1-RO01-KA203-063881*

3. Developing Data Literacy Courses for University Students (DEDALUS)

Description: DEDALUS - DEveloping DAta Literacy courses for University Students is aiming to equip students with the necessary competences to cope with future digital challenges and to create an additional value for the enterprises and industries where they would be employed. It will do so by developing an innovative modular, open and online learning curriculum to include data literacy competences in any study field. At the same time, through the CPD qualification for HE professionals it will develop the digital competences of educators, enabling them to transfer such competences in their practice. Data literacy is a cross-cutting competence which is relevant in all disciplines since data are used in a multitude of domains and future entrepreneurs, regardless of the type of business they wish to run, need to deal with data and analytics to make quicker and more brilliant decisions and to get the most from business intelligence solutions. At the same data literacy is a difficult concept, since the required knowledge, skills and attitudes related to it are dependent on the context and so is the competence level. Indeed, courses and certification paths available on the market, as well as in universities are only scattered approaches that are lacking a convincing learning and study trajectory oriented towards a competence framework which maps the competences along the requirements of the study domain and the future field of application. This again would increase the employability of the students since their expertise could be better identified.

Contact person: Prof. dr Uglješa Marjanović
Period of realization: 2019 - 2022
ID: *2019-1-IT02-KA203-063359*

4. CREATIVE DANUBE-INNOVATIVE TEACHING FOR INCLUSIVE DEVELOPMENT IN SMALL AND MEDIUM SIZED DANUBIAN CITIES (DANUBIAN_SMCs)

Description: The methodology used in the project implementation is in line with the principles agreed upon by The Erasmus + program, being primarily a collaborative educational project that emphasizes both the transfer of knowledge between university partners and between teachers and students of all partners. The methodology consists of a set of steps for each phase which is part of the activity plan, having as main focus to stimulate all participants to an innovative approach of teaching activities.

At longer term, the project will show how a Danubian SMCs can be better known and valorised with unconventional and creative teaching methods, getting to an inclusive and stimulative attitude both for teachers and learners and for local stakeholders. Through this, the project will create a link to the creativity and innovation requirements on the labor market and the expected competences of the graduates in spatial planning field.

The main results of our project are:

- Strengthen the regional dialogue among the partnership universities in the cross-disciplinary education field spatial planning;
- Contributing with new methodologies and innovative teaching approach to study the actual problematic of Danubian SMCs;
- Contributing with new perspectives, innovative and customized data and creative body of knowledge about the inclusive development of SMCs;
- Increasing the involvement of local stakeholders to real issues and problems of the inhabitants of Danubian SMCs.

Contact person: *Prof*. dr Milena Krklješ
Period of realization: 2019 - 2022
ID: 2019-1-RO01-KA203-063878

5. Information and Communication Technologies for Sustainable Tourism Development (ICT4STD)

Description :

The aim of the project is to use information and communication technologies to promote and develop sustainable tourism. The project defines several specific goals and uses new technologies for the development and improvement of courses related to sustainable tourism, as well as market activities in the field of tourism, enrichment of learning materials, as well as its own content, development of entrepreneurial skills students with the necessary needs sustainable development. tourism - planning business models and products.

Contact person: *Prof*. dr Bojan Lalić
Period of realization: 2019 - 2022
ID: 2019-1-PL01-KA203-065781

Erasmus+ Knowledge Alliances

Knowledge Alliances are innovative transnational projects which bring Higher Education Institutions and Businesses/enterprises together to work on common issues.

The overall aim is to help strengthen Europe's capacity to innovate and to support the modernisation of Europe's higher education systems.

There are 4 common EU strategic objectives

Making lifelong learning and mobility a reality

Improving the quality and efficiency of education and training

Promoting equity, social cohesion, and active citizenship

Enhancing creativity and innovation, including entrepreneurship, at all levels of education and training

The other objectives of Knowledge Alliances are the development of new, innovative and multidisciplinary approaches to teaching and learning, stimulating entrepreneurship and the entrepreneurial skills of higher education teaching staff and company staff as well as ffacilitation the exchange, flow and co-creation of knowledge.

1. Data Literacy at the interface of higher education and business-DATALIT

Description: Nowadays data literacy is widely considered a critical skill to have in the 21st century. It can be defined as the ability to read, work with, analyse, and argue with data, in order to derive meaningful information and knowledge. Employees with data literacy skills have become highly valuable in today's economy and labour market: more than ever before, employers demand some degree of data literacy from all employees, regardless of the professional role. Since data are used in a multitude of domains, data literacy is today an essential skill also for professionals like journalists, policy makers, etc. It is also a powerful enabler of civic engagement, as it empowers individuals and communities to keep governments transparent and accountable, tackle local issues, and navigate their own data ecosystems. The project DATALIT aims at: (1) offering to university students across different Faculties, the opportunity to reach a suitable level of data knowledge that they can use and apply appropriately and diversely throughout their personal and professional lives, (2) Narrowing the gap between business and academia and putting EU enterprises in direct contact with potential future employees or business partners properly trained to exploit data effectively. To meet this challenge, DATALIT will develop and pilot an approach based on a long-term partnership of academia, business and educational partners. After an in-depth research phase, aimed at identifying best practices and experiences of data literacy inclusion in EU higher education and to better understand the needs and expectations of the target groups (students, HE professionals, employers), the partners will define a common understanding of data literacy as competence and design a syllabus to orient the creation of data courses. In parallel, the partners will develop a digital learning environment to integrate the class-based courses and a sound validation and certification system connected to the EQF, ECTS and EUROPASS systems. The outputs developed will be piloted by the Universities involved and by students that will have the opportunity to apply their data skills through internship experiences in EU enterprises.

Contact person: Prof. dr Uglješa Marjanović
Period of realization: 2019 - 2022
ID: *612561-EPP-1-2019-1-IT-EPPKA2-KA*

2. A Knowledge Alliance of Agribusinesses, Academia and Business Angels for Disruptive Farm-to-Fork Agri-Tech Training (AgTech7)

Description: AgTech7 addresses the lack of inter-disciplinary knowledge and multi-actor mobilisation for future agri-tech disruptive applications on the entire farm-to-fork food-chain. For this purpose, the project will directly engage the following target groups: 1) European Universities' and Research Institutes' students, and, 'in-house' incubator managers; 2) Agribusiness companies (i.e. agri-tech and food-tech); and 3) Angel-investors. The project will advance their knowledge necessary to facilitate: 1) inter-disciplinarity in agro-education, integrating engineering innovation, agricultural know-how and entrepreneurial skills, while at the same time, 2) advancing European angels investors' and startup service providers' understanding on the emerging agri-tech future market opportunities.

Contact person: Prof. dr Stevan Stankovski
Period of realization: 2020-2022
ID: 612221-EPP-1-2019-1-RS-EPPKA2-KA

Erasmus+ Jean Monnet

Jean Monnet Activities are designed to promote excellence in teaching and research in the field of European Union studies worldwide. The activities also foster the dialogue between the academic world and policy-makers, in particular with the aim of enhancing governance of EU policies.

European Union studies comprise the study of Europe in its entirety with particular emphasis on the European integration process in both its internal and external aspects. The discipline also covers the role of the EU in a globalised world and in promoting an active European citizenship and dialogue between people and cultures.

There are 3 types of activities:

1. Teaching and Research: Jean Monnet Modules, Chairs and Centres of Excellence.
2. Support to Associations: Jean Monnet support to Associations.
3. Policy debate with the Academic World: Jean Monnet Networks and Jean Monnet Projects.

Key activities include courses, research, conferences, networking activities, and publications in the field of EU studies.

Opportunities are available to higher education institutions worldwide. Furthermore certain actions are open to organizations active in the European Union subject area and associations of professors and researchers specialising in European Union Studies.

1. Strengthening European Cultural Identity through Interdisciplinary Heritage Studies – CULTher

Description: Main purpose of the project is to establish series of lectures related to the field of the cultural heritage as important aspect of the European integration processes. Cultural policy represents a significant mean of economic and social cohesion in the context of European integration, while cultural heritage is recognized as both the manifestation of cultural diversity and a resource for sustainable cultural, social, environmental and economic development. On the other hand, strengthening international cultural cooperation, with clear initiatives and partnerships in the cultural sector, is an important component in European integration of Serbia. Therefore, we have recognized the significance of introducing and enhancing understanding of these issues among present and future researchers and practitioners in cultural sector in our country. The Module, designed for the students who do not automatically come into contact with European integration studies, would adopt an interdisciplinary approach, focusing on unique potential of heritage in supporting inter-cultural dialogue, comparison European and local cultural values, with understanding diversity as a mechanism for promoting unity, promotion national cultural heritage as the part of European cultural context, rising awareness of European cultural identity in local cultural traditions. It is assumed that envisaged series of lectures on the European cultural heritage would induce students' interests in the topic, extend and deepen knowledge of participants, and encourage greater level of professional cooperation, as Module would be opened to the students as well as for professionals working in the field. Expected overall impact of the project is a considerable contribution to the capacity building of human resources, increase of expertise and integrated interdisciplinary approach to protection and promotion of Europe's cultural heritage as a shared resource and bearer of the common European identity.

Contact person: Prof . dr Anica Draganić
Period of realization: 2019-2022
ID: 611433-EPP-1-2019-1-RS-EPPJMO-MODULE

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

Description: CIII-AT-0042-00-2021 exists since 23 years and represents an interdisciplinary network consisting of medical and engineering departments and grows. AT-42 keeps growing year by adding new partners every year – this time five new partners joined. Size matters because of the complexity of the subjects dealt with, so the expertise of each new partner is a valuable input for the whole network. On the other hand we are also trying to spread best practice solutions - so again, size matters.Our main are educational efforts are organizing several unique schools and workshops (for this application year) and one academy. All these schools and workshops are targeted to different topics as well as different education level – eg the “CEEPUS Summer Academy of Pediatric Medicine” to students, “CT School” or “School of Pediatric Haematology" to Radiology residents / specialists, or others like the “Summer School on Image Processing” to undergraduates or on Master respective PhD level. It is noteworthy to mention, that due to the organisation of the “CEEPUS Summer Academy of Pediatric Medicine” now a structural cooperation with the Univeristy of Brisbana / Australia and the Western University / Canada could be established with regular participation of their students. Therefore for these universities it’s synonym is “Educational Courses – Multidisciplinary”. In addition to these efforts CIII-AT-0042-00-2921 is trying to promote, advertise and enhance individual student mobility between partners during the lecture free time. There is continued scientific cooperation of partners and all together about 170 papers (congress contributions, book chapters/books) were published. Due to the involved institutions there is a strong focus on pediatric medicine.

As everywhere there more institutions more active than others but it generates gravitation to the others.

Contact Person: Prof. dr Tibor Lukić
Period of realization: 2020 – 2021
ID: CIII-AT-0042-16-2021

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 ionizing 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 behavior 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 utilized by electric and magnetic fields.

Contact Person: Prof. dr Branko Škorić
Period of realization: 2020 – 2021
ID: CIII-AT-0063-16-2021

3. New teaching technologies and new applications in modernization of teaching at the Faculties of Technical Sciences in connection with the needs of small and medium enterprises in the environment

Description: "Technology can and should play an important role in curriculum planning, development, delivery, assessment, and administration. Technology must be "institutionalized in a faculty"- integrated into the culture and classroom practice of a University" (Nelson, Post, & Bickel, 2001). Professional development is essential to ensure that teachers are able to choose the most appropriate technologies and instructional strategies to meet district curriculum goals and student learning needs. The primary reason teachers do not use technology is a lack of experience with the technology itself (Wenglinsky, 1998).Technological trends inspire restructuring of higher engineering education in the direction of improving competencies of graduates. Based on the project objectives and planned activities, the expected outputs from this project are: a) Modernized Engineering studies by changing modules and courses focused on the specific and applied area of new technologies and in relevance to the labour market needs. b) (Updated existing and built new capacities concerning equipment, teaching materials, teaching methods, and teaching staff in order to achieve quality and relevance of the newly developed modules and courses. c) Improved regional and international university networks in engineering leading to the improvement of higher education performance. d) Implemented Project Oriented Methodologies in the Universities, as an innovative pattern and pedagogical methodology for improving the graduates' skills and for obtaining sustainable industry-education cooperation. Introducing the new technologies in engineering education will have an impact on improving the level of competences and skills in WBC engineering graduates and at the same time will improve the attractiveness of the study program.

Contact Person: Prof. dr Milan Rackov
Period of realization: 2020 – 2021
ID: CIII-BA-1402-02-2021

4. 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.

Contact Person: Prof. dr Milan Rackov
Period of realization: 2020 – 2021
ID: CIII-BG-0703-09-2021

5. 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 Milan Rackov

Period of realization: 2020 – 2021

ID: CIII-BG-0722-09-2021

6. Modelling, Simulation and Computer-aided Design in Engineering and Management

Description: Advanced modelling and simulation frameworks and corresponding Computer-aided design tools have to be developed to provide methods and environments to deal with autonomous systems which are determined by intelligent and adaptive behavior. The know-how in the network "Modelling, Simulation and Computer-aided Design in Engineering and Management" can be useful in many ways to new traffic solution/Autonomous driving. A review of different partners' experience shows that the network can contribute in topics as: • Modelling, simulation and testing the electronic and communication aspects of automobiles and unmanned aerial vehicles (UAVs or drones); • Study, evaluation and applications of standards in Intelligent Transportation System - Network architecture, standards, routing protocols, coding and network security of VANETs; • Design of Arduino-based sensor network in smart parking systems; • Transmission line modelling for automotive applications; • Development of Software tests for electronic systems in automobiles, using the systems PROVETech and Vision, • Study on unmanned aerial vehicles (UAVs or drones) Safety regulations and Safety Management System. • Object detection and tracking from live video streams which can be exploited for realtime control of unmanned vehicles (robotics, automotive, aerospace) in natural geometric environment. Such environments are characterized with high level of uncertainty in their structure and state and few others.

Contact Person: Prof. dr Slobodan Morača
Period of realization: 2020 - 2021
ID: CIII-BG-1103-05-2021

7. Modern Approaches for Design, Production and Operation of Vehicles (MADPOV)

Description: The CEEPUS MADPOV Academic and Regional Cooperation Network is a unique network in terms of achieving sustainability of the decarbonisation goals of motor vehicles and sustainable mobility. Through educational and research programmes, human resources will be prepared to work in this field, taking advantage of the strengths of each of the participants in the network. Network members will be able to provide professional advice on targeted car decarbonisation activities and sustainable mobility. The contribution of the network to regional development in its area of competence, as well as the synergy effect of cooperation between partners, are the most important goals we strive to achieve. The best of the knowledge and skills and know-how of the participating institutions will be shared through consultations, seminars, discussions and more.

The field of research in the network requires the application of multi-discipline and crossdiscipline areas such as transport and vehicles, communication and information systems and technologies, electronics, ecology, new materials. The educational and scientific profile of the partners covers these areas, and new partners with relevant competencies will be invited. The network follows the goals of the Danube strategy for regional cohesion and the creation of a strong network of higher education institutions. The research in the design, production and operation of vehicles, including their processing to decarbonize, have a harmful effect on the climate.

Contact Person: Doc. dr Svetlana Bačkalić
Period of realization: 2020 - 2021
ID: CIII-BG-1502-01-2021

8. 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 free mover mobility. It is possible only by kind of interdisciplinary educational knowledge and multilateral co-operation among universities the European engineers.

Contact Person: Prof. dr Igor Budak
Period of realization: 2020- 2021
ID: CIII-CZ-0201-13-2021

9. 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 2019 – 2025 are 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: Prof. dr Mladomir Milutinovic
Period of realization: 2020– 2021
ID: CIII-HR-0108-14-2021

10.Research and Education of Environmental Risks

Description: A natural disaster is a major adverse event resulting from natural processes of the Earth; examples include floods, hurricanes, tornadoes, volcanic eruptions, earthquakes, tsunamis, and other geologic processes. Due to population growth and its concentration in densely populated areas there is an increasing need for modern society to be vigilant of the impact of catastrophic natural events. Every year, the number of disasters in the world is increasing. It causes more and more damage and deaths. Floods, forest fires and droughts, which do not choose either the place or time when to occur, have been causing irreparable damage, often threaten the lives of people, cultural, material resources and the environment. There are many areas, including towns and cities that are already at risk. Therefore, it is necessary to develop earthquake, tsunami or flood damage scenario by utilizing appropriate vulnerability assessment criteria, topographical information, building and infrastructure inventories, demographical data and other relevant facts. Seismic risk represents the degree of possible loss of human life and material assets in case of earthquake occurrence of a certain intensity in a given area and is usually expressed in relative numbers (in relation to the maximum possible loss). Seismic Risk Management is a process of systematic application of policies, procedures, treatments and monitoring of seismic risk. Managing risks means looking into the future, thinking ahead about the potential events, actions and consequences that one can be faced with in the future as a result of earthquakes, and taking timely measures to minimize risks, thereby avoiding or reducing adverse effects. Risk management includes: formal, quantitative evaluation of potential damage or loss at a given time interval; observation and correction of security deficiencies. The main objective is to provide sustainability in three crucial segments: development of leadership (human resources), capacity development (funds), raising public awareness (information, training and education).

Contact Person: Prof. dr Borko Bulajić

Period of realization: 2020 – 2021

ID: CIII-HR-1302-03-2021

11.Metronet- network for novel measuring and manufacturing technologies

Description: To produce goods or provide services companies need standards. Standardization is applied to achieve a certain level of orderliness that is optimal under specific circumstances by formulating procedures for general and repeated use and providing solutions to the existing or possible problems. In industry standards are necessary, for example, to specify the ways of communication and preparation of documents at the particular stages of product design and construction. They are responsible for process smoothness and the quality of semi- and finished goods. Of significance are also the quality assessment and control methods. Standardization plays a vital role in the engineering industry, particularly in the production of machinery and mechanical systems. It has been reported that the quality of machine parts is frequently dependent on the level of standardization. As it is extremely important to assure the accuracy of form, dimensions and surface texture, manufacturers of machine parts are required to follow the requirements known as Geometrical Product Specifications (GPS). Set by the International Standardization Organization (ISO), the documents provide guidelines for dimensioning, geometrical tolerance and measurement of geometric quantities at each stage of machine part generation, from design to assembly. Geometrical Product Specifications define the requirements concerning, for instance, the product functionality, safety, reliability and interchangeability. They need to be followed to obtain the required dimensional properties of ready products. Procedures are given to achieve the dimensional tolerance and that of geometric surface structure parameters, the latter including the geometric tolerance and the surface parameters tolerance.

Contact Person: Prof. dr Igor Budak

Period of realization: 2020 - 2021

ID: CIII-PL-0007-16-2021

12. 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: Prof. dr Milan Rackov
Period of realization: 2020-2021
ID: CIII-PL-0033-16-2021

13. Engineering as Communication Language in Europe

Description: In Europe, many national languages are used, however, very often engineers use their own slang, which is quite well understandable to them, regardless of their nationality. It has been 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 that CEEPUS Network titled “Engineering as Communication Language in Europe” is to create communication and cooperation between engineers, dealing with various engineering branches. The aim of the Network is to be able to create Interdisciplinary Engineering Teams. A strong background in engineering techniques applicable to a wide variety of complex problems is in demand in the widespread knowledge. Our engineers should understand more than one discipline and be prepared to work at the intersection of two or more engineering and science disciplines. 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. The main task of that Network is involving teachers from partner Institutions in order to create team projects that would be main parts of the program. It is also expected that students will take an active part in all didactic activities proposed by Network and will benefit from our Program, as much as possible. Thanks to engineering knowledge as well as soft skills (ability to work in an international team), all the students in their further career will be able to communicate freely and work in international companies as well as continue their education, e.g. doctoral studies in any university in the world. The CEEPUS Network "Engineering as Communication Language in Europe” gives the opportunity to create successful cooperation, not only between students, 2 but also between teachers from all the universities, which are participants in the network PL-701. Additionally, the Network is open for any open-minded people, who can participate in events organized by that network with using the Freemover Mobilities.

Contact Person: Doc. dr Borislav Savković

Period of realization: 2020-2021

ID: CIII-PL-0701-09-2021

14. Teaching and research in advanced manufacturing

Description: Teaching and research in advanced manufacturing in times of rapid development of the above thesis is very important. Technological development and improving the quality of people's lives are closely linked with the development of manufacturing processes and manufacturing techniques. There is a continuous development of automation and robotics manufacturing processes. Conventional machine tools are replaced with modern multipurpose and multi-axis machining centers, which are equipped with smart functions to enable a safe and user-friendly service, and optimal energy-efficient operation. Robotics and automation is concentrated not only on manufacturing, but also includes the rehabilitation of people, health and daily living assistance. As part of the development of technology, we will conduct research in the field of high-speed machining as advanced manufacturing. Very important aspect of mentioned above thesis is to link industry with the teaching of the field on advanced and at the same time environmentally friendly technologies. Planning processes, construction of virtual technological lines, robotics applications, everything must be linked with the concept of energy efficiency. We would like to make our project that will serve the development of advanced and modern manufacturing techniques, and the transfer of modern industrial knowledge to the sphere of education and training of new generations. The possibility of using practical knowledge while understanding manufacturing solutions in modern industrial plants creates for our project participants in the labor market advantage. After recognizing partners possibilities in the area of laboratory capabilities we would like to introduce from academic year 2019/2020 new activity for students as a short term excursion. During visit students will have the possibility to work in laboratories at Universities of partner project.

Contact Person: Ivan Matin
Period of realization: 2020-2021
ID: CIII-PL-0901-06-1920

15. Internet of Things and Teleinformatics – ITT network

Description: Fast developies of Internet and Communication Technology (ICT) has been observed recently. Global networking infrastructure contains millions of cables, optic fibres, computers, servers, mobilies and other elements to keep the connection alive. The current networks are being used almost in every aspect of our daily life. The expansion of micro and nanodevices as well as Internet of Things (IoT) devices in home, offices and industry are another reason for increasis the role of ICT. IoT technology using Internet will integrate all object communicating with human beings as well as other devices. IoT refers to the networked interconnection of objects which are often equipped with artificial intelligence, so it is strongly related to Industry 4.0 and 5G Technology. With the current fast expansion of the ICT, the needs for development of reseach in ICT, Industry 4.0, 5G Technology, programming, network architecture, exploitation, testing wire and wireless computer networks, and cybersecurity have increased. There are many positions on the job market for the engineers with knowledge and skills in the field of advanced technologies. There is a necessity to include these issues in study programs at university level. The main goal of the network is collaboration in educations and research activities in computer science. The net will be dedicated for students, young and experienced researchers as well as for industrial partners, and provides an exchange platform for networks knowledge and know-how. elaborate and implement joint study program in the field of advanced methods of computer engineering and teleinformatics.

Contact Person: Prof. dr Milan Rackov
Period of realization: 2020-2021
ID: CIII-PL-1509-01-2021

16. Teaching and Research of Environment-oriented Technologies in Manufacturing

Description: Traditional academic exchanges are justifiable from the social-cultural standpoint, permitting as it does the circulation of scientific knowledge, research techniques and pedagogical approaches. Academic exchanges allows the individual to engage in professional development and networking, representing an investment in human capital by higher education system that is likely to bring returns in the form of innovation in teaching and research. However, the benefits of this type of mobility occur principally in both universities (home and host, via the exchange of knowledge, experience and practice) and can help to make our universities more attractive as a study destination. The skills, competences and qualifications that people need, are changing over time and must be developed in line with the evolving needs of the labor market. This means that educational systems must know the current requirements of the labor market and also to continuously adapt their curriculum to them. The exchanges of experience and mobility between partner universities can strongly support these and can help to acquire the key competences needed to enable them to adapt flexibly to such changes. In the global economy, when the labor market evolves at a faster rate than education and training, international experience becomes more and more important and mobilities are bridges that can reduce the "speed" between the two. In this connection, one of the major objectives of this project is contributes to develop the education and training systems to facilitate peer learning and the exchange of good practices and to follow up developments and progress of these, through reports, after semester mobility. The main objective for prolongation of the network is to continue to offer the possibility for participants to access mobilities, through which they can obtain more information about the importance, advantages and limits of environment-oriented technologies, tools, and methods.

Contact Person: Prof. dr Milenko Sekulic, Doc. dr Boris Agarski
Period of realization: 2020-2021
ID: CIII-RO-0013-16-2021

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

Description: “Globalization, new technologies and demographic developments constitute an enormous challenge; one of the answers to this problem is the access to lifelong learning." (Jan Figel, former European Commissioner for Education, Training & Culture, 2004-2009) A learning system based on formalized teaching but with the help of electronic resources is known as E-learning. While teaching can be based in or out of the classrooms, the use of computers and the Internet forms the major component of E-learning. E-learning can also be termed as a network enabled transfer of skills and knowledge, and the delivery of education is made to a large number of recipients at the same or different times.(The Economic Times, 2018) 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 specialists. 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. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM. It can be self-paced or instructor-led and includes media in the form of text, image, animation, streaming video and audio.

Contact Person: Prof. dr Aco Antić
Period of realization: 2020-2021
ID: CIII-RO-0202-14-2021

18. Intelligent Automation for Competitive Advantage

Description: On the basis of developed relationships through CEEEPUS II 05/06 academic year IntACA group is continuing joint work with broadening on new members from Austria (Graz, Vienna), Poland (Krakow), Macedonia (Skopje) and Slovakia (Kosice) in 2007, from Bosnia & Herzegovina (Zenica) in 2008 and from Hungary (Budapest) and Croatia (Slavonski Brod) in 2009; in 2011 we added a new partner from Bosnia & Herzegovina (Sarajevo), in 2012 we added two new partners (Cluj-Napoca - Romania and Kishinev - Moldova) in 2013 we added one new partner from Austria: CAMPUS 02 - University of Applied Sciences, in 2014 we added Transilvania University of Brasov, Romania; in 2015 we added University of Istocno Sarajevo, Faculty of Production and Management from Bosnia and Hercegovina; in 2016 we added University of Split (Croatia) and Technical College Cacak (Serbia); in 2018 we added two new partners: Polytechnic of Rijeka (Croatia) and Czestochowa University of Technology (Poland); and this year we are also planning to add one new partner: University of Kragujevac, Faculty of Engineering (Serbia). With great enthusiasm IntACA is continuing with operations of Joint PhD studies program (Thesis Supervision) supported by University of Maribor and University of Novi Sad, along with University of Split and Budapest University of Technology and Economics. This program serves as an example for other institutions in the network and create important experience for future cooperation. Network further aims to intensify contacts between the participating institutions by exchanging undergraduate and doctoral students and teachers. The network is based on the similarities, the common academic fundamentals, the same mission of the faculties, the similar structure of engineering and social sciences curriculum and the same problems in the participating countries. Also, the network advantages are certain experience in CEEPUS I, CEEPUS II and CEEPUS III from 2005 to 2017 activities, in Socrates - Erasmus projects at Faculty of Mechanical Engineering in Maribor, in JoinEU-SEE SIGMA and SIGMA Agile projects, WUS Austria, TEMPUS projects, and ERASMUS+.

Contact Person: Prof. dr Bojan Lalić
Period of realization: 2020-2021
ID: CIII-RS-0065-15-2021

19. Technical Characteristics Researching of Modern Products in Machine Industry 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 manufac-turers 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 Milan Rackov
Period of realization: 2020-2021
ID: CIII-RS-0304-13-2021

20. Research, Development and Education in Precision Machining

Description: The key change drivers in the case of machining technology include: Diminishing component size, enhanced surface quality, and tighter tolerances and manufacturing accuracies, reduced costs, diminished component weight and reduced batch sizes. The trends towards higher precision are occurring in virtually all areas of manufacturing. Higher precision is needed for several reasons · To obtain the high motion required in high-accuracy machine tools, computer peripherals, etc. · To guarantee robustness (optimal functionality under varying circumstances. · Creating information on advanced materials and the possibilities of their application · To guarantee part interchange ability (avoid adjustments), and hence to allow mass production at low price. Metal machining industry is under increasing pressure as a result of competition, stricter environmental regulation, supply chain demand for improved environmental performance and falling skill levels within industry. Adopting sustainable manufacturing practices offers material machining companies a cost effective route to improve their economic, environmentally and social performance. The alternative sustainable production, have to put all three levels on the same equal level. Sustainability products principles are considering manufacturing costs, energy consumption, waste management, environmental impact, operation safety and personal health. The education system ought to be preparing knowledge based, well skilled and trained people for the future practice. It is a main task of Universities but it could be realized only with narrow cooperation among them. As known each university (technical Institution) has its own strongpoint in the research, development and education. Therefore, knowledge based and well skilled experts could be prepared well when this strongpoint will be used for students' education and teacher cooperation. The exchange mobility program Ceepus could be enabled in mentioned effort.

Contact Person: Doc. dr Borislav Savković
Period of realization: 2020-2021
ID: CIII-RS-0507-10-2021

21. 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 inconstant 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: Prof. dr Živko Pavlović
Period of realization: 2020-2021
ID: CIII-RS-0704-09-2021

22. 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: Prof. dr Marinko Maslarić
Period of realization: 2020-2021
ID: CIII-RS-1011-06-2021

23. 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: Prof. dr Siniša Bikić
Period of realization: 2020-2021
ID: CIII-RS-1012-06-2021

24. Applied Hydroinformatics

Description: The main goal is the modernization and internationalization of Applied Hydroinformatics program through the cooperation with CEEPUS partners. The modernized program will be a good tool for utilizing in a unity the excellent and the specific methods of education and research in engineering elaborated by the individual partner institutions. The mobility and integration of students and teachers in the Danube region, the Central, Eastern and SouthEastern European regions will enable to achieve results in education and research on a higher level. The students will be able to solve problems of hydrology, hydraulics and environmental engineering for better water management using simulation modeling and IT. Therefore, the basic aim of the proposed project is to improve the international cooperation in education between CEEPUS partners, increasing the mobility and giving the possibility to the PhD students to develop and finish of joint PhD theses through the new developed Joint PhD Programme named "Applied Hydroinformatics".

We recognized the need for interdisciplinary approach in hydrology. Therefore, the main aim of the proposed CEEPUS project is the promotion and implementation of Joint programs in study area of hydrology, especially in the domain of applied hydroinformatics. This will be possible on the base of establishing a network with partners' institutions in education and research in the field of hydrology, civil engineering, computer science, statistics and environmental science (mainly in soil and water systems). The Joint PhD program named "Applied Hydroinformatics" will connect experts from different fields of science who will exchange their scientific knowledge through the workshops and excursions within CEEPUS members. This will be good start for further academic cooperation.

Contact Person: Prof. dr Ljubomir Budinski
Period of realization: 2020-2021
ID: CIII-RS-1112-05-2021

25. Multidisciplinary Approach to Education and Research in the Field of Digital Media Production

Description: This project primarily aims to form a respective network in the field of digital media production where multidisciplinary approach to education and research in this field will be practiced through which the knowledge and educational skills on the subject will be significantly improved. The improvements will have a basis in constant research and education in key areas, computer-assisted creation and editing techniques. The research and education will include the field of design, contemporary post production techniques, video and sound editing, 3D animation, motion design, computer games, WEB design, multimedia. Combining a multidisciplinary theoretical background with practical approach, the project will contribute to research and education development in creative media and project-based collaborations which demand an increasingly fluid and mobile workforce. Every participant will conduct this research in their field of interest. The common benefit will be the possibilities for undergraduate students, Ph.D. students and teachers to work on M.Sc. and Ph.D. thesis in the field of their interest which might not be their home institution. In cooperation with network partners, lectures, seminars, summer courses and scientific conferences and workshops will be organized. The universities included in this network have been collaborating with each other, for some years. Several partners have experience and achievements in the different European projects cooperation. CEEPUS project represents a very useful formal way for cooperation between the partner institutions. The network assures an efficient possibility for students and teachers mobility that contribute to a mutual acquaintance and valuable educational and research programs development. Exchange of knowledge and experience is crucial for each university teacher and student.

Contact Person: Prof. dr Sandra Dedijer
Period of realization: 2020-2021
ID: CIII-RS-1311-03-2021

26. Interdisciplinary approach for enhancing knowledge in supply chain analytics (SCAN)

Description: Supply chains (SCs) are complex systems, which involve different organizations with different goals and objectives. The overall goal of all organizations involved in SC is to create a profit by satisfying the costumer's demand for products or services. The business uncertainty (market conditions) is among the most important challenges facing modern SCs, and it poses considerable difficulties in terms of SC planning and control. Design of SC as well the strategic and operational decisions depend on the expectations of what will be the market conditions in the following planning period. In today's changing markets, business uncertainty can emerge from a range of different sources: volatile and hardly predictable resources prices (oil), varying micro and macroeconomics indicators in different regions, wide costumers base spread all over the world, demand volatility generated by end customers, political and climate challenges, etc. Accordingly, SCs are faced with huge obstacles in providing the value for the end costumers in this changing environment. In order to deal with today's business challenges, SCs need modern analytic tools to overcome the "bridge of uncertainty" in everyday business. This project explores the various analytical tools and techniques which can be used in providing support for the decision making in a real SC. Accordingly, the project will be focused on building, enhancing and sharing the knowledge base about different kind of mathematical and simulation models for dealing with the business uncertainty in modern markets, as well as educating the future SC practitioners with analytical techniques, categorized in terms of descriptive, predictive and prescriptive analytics, which are needed in the contemporary markets.

Contact Person: Prof. dr Svetlana Nikoličić
Period of realization: 2020-2021
ID: CIII-RS-1412-02-2021

27. Chemistry and Chemical Engineering

Description: The main objectives of the Ceepus network CIII-SI-0708 would be as follows:

• to establish a research center of excellence in the fields of process efficiency, renewable resources, new products and materials, cycle economy and sustainable development,

• to promote research work among students at all three levels in order to build a research excellence from Bachelor level through Master level up to Doctoral level. Students should acquire the competencies for independent and innovative research work,

• to establish research synergies among participating institutions in order to develop holistic, integrated, efficient and sustainable process solutions for some of the most challenging problems, such us depletion of fossil fuels, depletion of important chemical elements, transition from linear to circle economy, preservation of environment, efficient production, development of new products and materials.

The main goal of Ceepus network CIII-SI-0708 would be to foster and promote excellent research work among students at all three study cycles within the fields of chemical engineering, chemistry and biochemistry. The main emphasize would be on the PhD students, however, considering that the number of doctorate students can be limited, also Master and Bachelor research work would be promoted. The research cooperation among partner institutions has been developing since the beginning of this network in year 2012/2013, and shall be even strengthen in the future. The motivation would be inventing those research areas that are beyond-state-of-the-art within the fields of chemical and process engineering, chemistry, biotechnology, environment protection, energy and material efficiency, green- and low carbon technologies for production of energy and chemicals from renewable sources.

Contact Person: Prof. dr Dunja Sokolovic
Period of realization: 2020-2021
ID: CIII-SI-0708-08-2021

28. Architecture Landscape Interiors Culture Emotions (A.L.I.C.E.)

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: Prof. dr Živko Pavlović

Period of realization: 2020-2021

ID: CIII-SI-0719-09-2021

29. Training and research in environmental chemistry and toxicology

Description: The collaboration among some partners in the region has started already fifteen years ago through Association of Chemistry and the Environment (ACE) between partners from University of Ljubljana, Faculty of Health Sciences (prof. Polonca Trebše), University of Belgrade, Faculty of Chemistry (prof. Branimir Jovančičević) and Brno University of Technology, Faculty of Chemistry (prof. Josef Caslavsky). They collaborated through the research as well as in the development of new study programmes and study materials in the field of environmental chemistry and toxicology (TEMPUS project). Our common points of interest represent pollutants, coming from different sources like industries, agriculture, human activities, affect different environmental spheres such as air, water, soil, and pose serious threat to the ecosystems and living organisms. From that reason we wanted to connect not only teachers in the region but mostly students to work on real environmental problems and get insight to them. The network represents a basis for the establishment of collaboration between faculties with the main objective: to provide expertise and infrastructure for interdisciplinary education and research of future experts in the fields of environmental chemistry and toxicology. Within the last five years: - We performed intensive exchange of students and professors within the network. - Several students performed the research work to obtain more skills and experiences (e.g. Adna Čolakovič, Nejra Kovač, Igor Akrap, Lara Čižmek) - Several students performed the research work within master of doctoral thesis (e.g. Šenan Hadžibegić, Hena Divanović, Štefan Kulaš, Marcin Podražka, Anamarija Milisav, Jerca Bajuk, Katarina Bertović).

Contact Person: Prof. dr Mirjana Vojinović Miloradov
Period of realization: 2020-2021
ID: CIII-SI-0905-07-2021

30. 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 utilization 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: Prof. dr Đorđe Vukelić
Period of realization: 2020-2021
ID: CIII-SK-0030-16-2021

31. Applied Economics and Management

Description: The CEEPUS network "Applied Economics and Management" is a prolongation of the already existing network coordinated by the Faculty of Economics and Management of the Slovak University of Agriculture in Nitra, Slovakia. Based on the very positive feedback, good practice and experience from previous academic years, we are planning to: ϖ continue the networking between universities in the field of applied economics and management and related fields as well as carry out coordinating network activities; ϖ in order to make the network activities more efficient, we are re-evaluating the cooperation within the partnership annually and based on the growing interest in participation in our network we are accepting new partners; ϖ enable undergraduate student, doctoral student and teacher exchanges (with growing demand for short term excursions) to facilitate the emphasis areas at the host institutions, with using the library and other resources; ϖ organize and manage the work of experts' groups in applied economics and management (namely in the field of economics, management, marketing and applied agri-sector economics as well as emerging market studies); ϖ implement participation in lectures, workshops, conferences and seminars devoted to areas of expertise – special focus on guest lecturers aimed at the transfer of know-how and enriching the education process; ϖ implement the International Master Double Degree study program "Business Economics" offered by two universities of the network – the Slovak University of Agriculture in Nitra and the University of Agriculture in Krakow; ϖ involve teachers from our partner universities in lecturing the managerial course MBA at the coordinating institution, the Slovak University of Agriculture in Nitra;

Contact Person: Prof. dr Slavica Mitrović Veljković
Period of realization: 2020-2021
ID: CIII-SK-0044-15-2021

32. ADVANCES IN MACHINING: Education and Manufacturing Challenges in Industry 4.0 Environment

Description: The Network SK 0067 had started its activities since September 2005. The stress of the ongoing project will be done on continual improvement of all planned activities as well as on development of high level technical education in accordance with the industry demand. (During academic year 2019/2020 it was as umbrella network) Every year, all partners involved to the network have confirmed their willingness to cooperate and all have invest a lot of effort in order to fulfil the objectives stated in the project with larger or smaller success. Universities included in this project have long term cooperation on various levels (education, research, personal contact). There is new partner join to the project – VŠB Technical University in Ostrava (VSB-TUO). The main areas of cooperation established during this network are as follows: 1. Team of teachers actively and regularly have lectures in participating institutions as a part of regular educational activities. 2. Organization of scientific conference (previously workshop) for PhD students and teachers; the first workshop had been organized in Cracow in April 2006; and since this time at CUT Cracow there it is a practice to be held, yearly. We hope that this good practice will continue in future. Lectures presented in the workshop are published yearly in Research Report edited by CUT Cracow. 3. Assistance with PhD thesis and joint thesis supervision. 4. Utilization of unique laboratory equipment for PhD and master thesis preparation (for example: in the field of metal cutting, surface integrity and roughness measurement and cutting process phenomena identification via monitoring, CAD/CAM/CAE implementation into machining, etc.)

Contact Person: Doc. dr Borislav Savković
Period of realization: 2020-2021
ID: CIII-SK-0067-16-2021

33. 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: Doc. dr Borislav Savković
Period of realization: 2020-2021
ID: CIII-SK-0405-12-2021

34. 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.
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: Prof. dr Milena Krklješ
Period of realization: 2020-2021
ID: CIII-SK-0606-10-2021

35. Research and Development of New Technologies for Innovative Services in Sustainable Logistics 4.0

Description: Present time conditions of modern business environment indicate that the market competition will demand from the participants in supply-chain management abilities which enable instant responses to market requirements. Because of that, intense development of the production is required, especially intense development concerning organization and the automation of complex mechanized transport and warehouse equipment. In order to achieve a higher level of efficiency, the strategy needs to be oriented towards investments in new, smart technology. This CEEPUS network has interrelated objectives: to understand the current situation as regards sustainable logistics in Europe and world, to present a snapshot of the current developments in sustainable logistics, supply chains and innovative services in different countries participants, to provide insight into the trade-off between environmental impacts, cost and supply-chain performance under different transport strategies oriented towards smart technology, etc. Many companies are limited to measuring the sustainability of their own business operations and are unable to extend this evaluation to their suppliers and customers. This makes determining their true environmental costs highly challenging and reduces their ability to remove waste from the supply chains. However much progress has been made in defining supply chain sustainability and benchmarking tools are now available that enable sustainability action plans to be developed and implemented.

Contact Person: Prof. dr Milan Rackov
Period of realization: 2020-2021
ID: CIII-RS-1511-01-2021

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. A pan-European Network for Marine Renewable Energy (WECANet)

Description: The pressure of climate change and the growing energy demand has increased interest in marine renewable energy resources, such as wave energy which can be harvested through Wave Energy Converter (WECs) Arrays. However, the wave energy industry is currently a significant juncture in its development, facing a number of challenges which require that research re-focuses onto a techno-economic perspective, where the economics considers the full life-cycle costs of the technology. It also require development of WECs suitable for niche markets, because in Europe there are inequalities regarding wave energy resources, wave energy companies, national programs and investment. As a result, in Europe there are leading and non-leading countries in wave energy technologies. The sector also needs to increase confidence of potential investors by reducing (non-) technological risks. This can be achieved through an interdisciplinary approach by involving engineers, economists, environmental scientists, legislation and policy experts etc. Consequently, the wave energy sector needs to receive the necessary attention compared to other more advanced and commercial ocean energy technologies (e.g. tidal and offshore wind).

The formation of the first pan-European Network on an interdisciplinary marine wave energy approach will contribute to a large-scale WEC Array deployment by dealing with the current bottlenecks. The WECANet Action aims at a collaborative approach, as it provides a strong network platform that also crates the space for dialogue between all stakeholders in wave energy. WECANet's main target is the equality research, collaboration and funding opportunities for all researchers and professionals, regardless of age, gender and location.

Contact person: Prof. dr Branka Nakomčić-Smaragdakis
Period of realization: 2018 – 2022
ID: COST Action CA17105

2. European Network for Game Theory (GAMENET)

Description: With the rapid advancement of technological innovations, modern societies rely more and more on the proper functioning of complex networks (i.e., social, telecommunication and transportation networks). Since the state and the dynamics of these networks are determined by independent decision makers, a solid understanding, control and optimization of such networked systems constitutes a major challenge for modern societies.

Game theoretic concepts are nowadays used in the analysis of networked systems, such as the computation of traffic equilibria in large-scale transportation networks, the prediction of content popularity in social networks and online services, and the analysis of the spreading of diseases and epidemics. Since there are many applications from different fields exhibiting similar network structures (e.g., biological, technological and social networks) and each of these applications has field-specific characteristics, our Action needs to bring together researchers from different fields of science, such as, applied mathematics, algorithmic computer science, engineering and economics.

The key objective of this Action is to facilitate interactions and collaborations between different groups of game theorists, to provide game theoretic expertise to industrial partners, and to establish a large and vibrant interconnected community of excellent scientists in these different fields. This Action will be the first European network where computer scientists, applied mathematicians, economists, and operations researchers will join forces on problems with significant technological and socio-economic impact. On a meta-level, the aim is to create a broad community of game theorists across Europe and at every stage of their career and to facilitate contact with stakeholders.

Contact person: Prof. dr Dejan Vukobratović
Period of realization: 2017 – 2021
ID: COST Association COST Action CA16228

3. INDoor AIR POLLution NETwork

Description: In developed countries, we spend 80%-90% of our time indors, where we recover most of our exposure to air pollution. However, regulation for air pollution focuses mainly on outdoors and the indoor environment is much less well characterized. The concentration of many air pollutants can be higher indoors than out, particularly following activities such as cleaning and cooking. With increasing climate change impacts, related energy efficiency measures are making buildings considerably more airtight. Such measures can increase both the indoor and outdoor environments and the role of ventilation, in order to mitigate through approrttiate building operation, use and design. INDAIRPOLLNET (INDoor AIR POLLution NETwork) will improve our understanding of the cause of high concentration of indoor air pollutants.It will assemble experts in laboratory and chamber experiments, modeling studies and measurements of relevance to indoor air quality (IAQ), including outdoor air chemists. Our network includes experts in chemistry, biology, standardization, particulate matter characterization, toxicology, exposure assessment, building materials (including those manufactured specifically to improve IAQ such as green materials), building physics and engineering (including ventilation and energy) and building design. This Action aims to significantly advance and field of indoor air pollution science, to highlight future research areas and to bridge the gap between research and business to indentify appropriate mitigation strategies that optimize IAQ. The findings will be disseminated to relevant stakeholders such as architects, building engineers and instrument manufacturers.

Contact person: Prof. dr Dunja Sokolović
Period of realization: 2018- 2022
ID: COST Action CA17136

4. European Middle Class Mass Housing (MCMH)

Description: The main challenge of this Cost Action is to create a transnational network that gathers European researchers carrying studies on Middle-Class Mass Housing (MCMH) BUILD IN Europe since the 1950s. This network will allow the development of new scientific approaches by discussing, testing and assessing case studies and their different methodologies and perspectives. MCMH has been generally underestimated in urban and architectural studies and there is still a lack of comparative analysis and global perspectives. The number of transnational publications and scientific meetings has been scares. By crossing different approaches focus on Architecture, Urbanism, Planning, Public Policies, History, Sociology new concepts and methodologies will arise. Therefore, the Action aims to produce a wider understanding of MCMH sprawl, deepening on-going researches and focusing on the existing case studies. The current methodology , surveys, and contextualization allow an initial mapping of relevant case studies, their diverse degrees of resilience and how they have been adapted to current (urban and social) conditions. It is intended to develop the knowledge of the interaction between spatial forms, behaviors, and satisfaction and to combine methodologies of architectural and social analysis. The Action will be developed by three Working Groups, coordinated by a Core Group: Documenting the MCMH; Development of a specific set of (new) concepts for MCMH analyses; Leverage contemporary architecture interventions and Public Policies. In the Action will be involved researchers related to Mass Housing, MCMH Architecture and Urbanism, Planning and Public Policies, Sociology Studies, Architecture History and Modern Heritage.

Contact person: Prof. dr Milena Krklješ
Period of realization: 2019 – 2023
ID: COST Action CA18137

5. Chemical On-Line cOmpoSition and Source Apportionment of fine aerosoL

Description: It is well known that exposure to aerosols exerts a negative impact on human health and that aerosols affect climate and the environment. These effects are dependent on the composition and sources of these fine atmospheric aerosols (particulate matter with aerodynamic diameter below 2.5um, PM2.5). The main challenge of the Action is to consistently assess their spatial variability (across Europe), their temporal variability (at a one hour time resolution or better), their seasonality (using long term datasets), their phenomenology (chemical composition) and their sources. To this end many research groups and some air quality monitoring networks in Europe and across the world have acquired recently-developed chemical composition measurement instrumentation. These include the Aerosol Chemical Speciation Monitor (ACSM) (based on Aerosol Mass Spectrometer (AMS) technology), which measures non-refractory ammonium, nitrate, sulfate, chloride, and organic mass, and instruments that measure the refractory black carbon, such as the Aethalometer and Multi Angle Absorption Photometer (MAAP). These new high time resolution techniques, which chemically characterize the aerosols, are capable of operating for long time periods and have only been available in 5-10 years. The processing and interpretation of the data from these instruments has matured to a stage where harmonized across Europe is now possible; this will be achieved by a network built through the present Action to jointly develop the capacity for the interpretation of the measurements gathered using these techniques. The outcomes of the Action will be relevant for air quality modellers and policy makers.

Contact person: Prof. dr Dunja Sokolović
Period of realization: 2017 – 2021
ID: COST Association COST Action CA16109

6. International Interdisciplinary Network on Smart Health Age-friendly Environments – NET4AGEFRIENDLY

Description: "To promote social inclusion, independent living and active and healthy ageing in society, the NET4AGEFRIENDLY COST Action will establish an international and interdisciplinary network of researchers and stakeholders from all sectors. Its aim is to foster awareness, and to support the creation and implementation of smart, healthy indoor and outdoor environments for present and future generations. NET4AGE-FRIENDLY further aims to overcome fragmentation and critical gaps at both conceptual and pragmatic innovation level on responsive, age-friendly and sustainable environments to address European research and policy challenges. The main approach of NET4AGE-FRIENDLY is the establishment of local or regional ecosystems in each COST country involved, to work on health and well-being in an age-friendly digital world. The ecosystems will consist of citizens, public authorities, businesses/NGOs and researchers. They will be supported by four thematic Working Groups (User-centered inclusive design in age-friendly environments and communities; Integrated health and well-being pathways; Digital solutions and large-scale sustainable implementation; Policy development, funding forecast and cost-benefit evaluations). The outcomes of the thematic Working Groups will be integrated by a dedicated Working Group to create a synergized output as a Reference Framework. NET4AGE-FRIENDLY will be used as a connector for involving and hosting regular themed sessions with local and regional stakeholders and users' representatives from various countries and backgrounds, as well as for fostering the knowledge creation and sharing among researchers. Particular attention will be devoted to promoting the involvement of Early Career Investigators, entrepreneurs and participants from COST Inclusiveness Target Countries"

Contact person: Prof. dr Tatjana Lončar-Turukalo
Period of realization: 2020 – 2024
ID: CA COST Action CA19136

7. Wider Impacts and Scenario Evaluation of Autonomous and Connected Transport

Description: Autonomous vehicle (AV) trials are currently taking place worldwide and Europe has a key role in the development of relevant technology. Yet, very limited research exists regarding the wider implications of the deployment of such vehicles on existing road infrastructure, since it is unclear if and when the transition period will start and conclude.

It is anticipated that improved accessibility and road safety will constitute the primary benefits of the widespread use of AVs, whilst co-benefits may also include reduced energy consumption, improved air quality or better use of urban space. Therefore, the focus of this COST Action is on observed and anticipated future mobility trends and implications on travel behavior, namely car sharing, travel time use or residential location choice to name a few. Other important issues to be explored under different deployment scenarios are social, ethical, institutional and business impacts.

To achieve this, it is essential to culminate co-operation between a wide range of stakeholders at a local, national and international level, including academics and practitioners. Consequently, this COST Action will facilitate collaboration within Europe and beyond about this emerging topic of global interest.

Contact person: Prof. dr Todor Bačkalić
Period of realization: 2017 – 2021
ID: CA COST Action CA16222

8. Distributed Knowledge Graphs - DKG

Description: Knowledge Graphs are flexible way to represent information about virtual anything. People from a variety of application domains including biomedical research, public and open data, linguistics, journalism, and manufacturing publish, use, and investigate knowledge graphs. As the publication is done in a decentralized fashion across the web, the knowledge graphs form a distributed system. Due to the ever-increasing uptake of Knowledge Graphs technologies in recent years, there are new challenges for research and development including dealing with the scale and the degree of distribution of knowledge graphs, while monitoring and maintaining data quality and privacy. Tackling these research challenges will need a stronger collaboration within the research community and a joint effort to establish a more functional, decentralized Web of Data. The main aim of the action is therefore to create a research community for deployable Distributed Knowledge Graph technologies that are standards-based, and open, embrace the FAIR principles, allow for access control and privacy protection, and enable the decentralized publishing of high quality data. To this end, the Action connects European researchers and practitioners from 1) diverse application domains and 2) the whole life cycle of Distributed Knowledge Graphs, from provisioning to finding, access, integrating, programming, deploying, enriching and analytics. The Action will develop practices for scalable, privacy-respecting, high quality and decentralized Knowledge Graph publication and consumption, reach out to the European industry, and formulate a research agenda.

Contact person: Prof. dr Stevan Gostojić
Period of realization: 2020 – 2024
ID: CA COST Action CA19134

9. *Reliable* roadmap for certification of bonded primary structures- CERTBOND

Description: With the increasing pressure to meet unprecedented levels of eco-efficiency, aircraft industry aims for superlight structures and towards this aim, composites are replacing the conventional Aluminum. The same trend is being followed by civil, automotive, wind energy, naval and offshore industry, in which the combination (or replacement) of steel with composites can increase the strength-to-weight ratio. However, the joining design is not following this transition. Currently, composites are being assembled using fasteners. This represents a huge weight penalty for composites, since holes cut through the load carrying fibers and destroy the load path. Adhesive bonding is the most promising joining technology in terms of weight and performance. However, its lack of acceptance is limiting its application to secondary structures, whose failure is not detrimental for the structural safety. In primary (critical-load-bearing) structures, fasteners are always included along bond lines, as “back-up” in case the bond fails. The main reason for this lack of acceptance are the limited knowledge of their key manufacturing parameters, non-destructive inspection techniques, damage tolerance methodology and reliable diagnosis and prognosis of their structural integrity. The Action aims to deliver a reliable roadmap for enabling certification of primary bonded composite structures. Despite the motivation being aircraft structures, which is delivered to have the most demanding certification, it will directly involve other application fields in which similar needs are required. The Action will tackle the scientific challenges in the different stages of the life-cycle of a bonded structure through the synergy of multi-disciplinary fields and knowledge transfer.

Contact person: Prof. dr Dragan Rajnović
Period of realization: 2019 – 2023
ID: CA COST Action CA1

10. Statistical and machine learning techniques in human microbiome studies

Description: In recent years, human microbiome has been characterized in great detail in several large-scale studies as a key player in intestinal and non-intestinal diseases, e.g. inflammatory bowel disease, diabetes and liver cirrhosis, along with brain development and behavior. As more associations between microbiome and phenotype are elucidated, research focus is now shifting towards causality and clinical use for diagnosis, prognostics and therapeutics, where some promising applications have recently been showcased. Microbiome data are inherently convoluted, noisy and highly variable, and non-standard analytical methodologies are therefore required to unlock its clinical and scientific potential. While a range of statistical modeling and Machine Learning (ML) methods are now available, sub-optimal implementation often leads to errors, over-fitting and misleading results, due to a lack of good analytical practices and ML expertise in the microbiome community. Thus, this COST Action network will create productive symbiosis between discovery-oriented microbiome researchers and data-driven ML experts, through regular meetings, workshops and training courses. Together, it will first optimize and then standardize the use of said technique, following the creation of publicly available benchmark databases. Correct usage of these approaches will allow for better identification of predictive and discriminatory “omic” features, increase study reliability, and provide mechanistic insight into possible causal or contributing role of the microbiome. This action will also investigate automation opportunities and define priority areas for novel development of ML/Statistics methods targeting microbiome data. Thus, this COST Action will open novel and exciting avenues within the fields of both ML/Statistics and microbiome research.

Contact person: Prof. dr Tatjana Lončar-Turukalo
Period of realization: 2019 – 2023
ID: COST Action CA18131

11. The European Aquatic Animal Tracking Network

Description: Telemetry is a commonly applied method to investigate the ecology and movement behavior of aquatic species in relation to their environment. It provides a scientific basis for management and conservation and has significantly improved our understanding of ecosystems functioning and dynamics. More specifically, telemetry provides valuable data that can be used in many policies and directives. As s result, large scale nationally and regionally managed initiatives were implemented around the globe in recent years. Although there is a large and growing number of researchers in Europe using biotelemetry to study aquatic animals and answer management-related questions, there is a stringent lack of in-field telemetry collaborations in Europe. This situation represents a substantial loss of opportunities for: scientific excellence, funding opportunities and competitivity of European SME on the international biotelemetry market. With this Cost Action we want to close this gap and the overarching objective is to ensure a transition from a loosely-coordinated set of existing regional telemetry initiatives to a sustainable, efficient and integrated pan-European biotelemetry network embedded in the international context of already existing initiatives. This will be achieved through working group meetings, workshops, training courses and scientific missions focused on: 1) Implementing a centralized European database, requirements and policy mapped to the data standards of existing international biotelemetry data system, 2) Improve the usefulness and inter-applicability of currently available technology and foster technological advancement, 3) promoting the establishment of key telemetry infrastructure and research on key species, and 4) Provide continuous training opportunities and disseminate knowledge to the stakeholders' community.

Contact person: Prof. dr Sebastian Baloš, Prof. dr Dragan Rajnović
Period of realization: 2019 – 2023
ID: COST Action CA18102

12. European Network on Future Generation Optical Wireless Communication Technologies (NEWFOCUS)

Description: Telemetry is a commonly applied method to investigate the ecology and movement behavior of aquatic species in relation to their environment. It provides a scientific basis for management and conservation and has significantly improved our understanding of ecosystems functioning and dynamics. More specifically, telemetry provides valuable data that can be used in many policies and directives. As s result, large scale nationally and regionally managed initiatives were implemented around the globe in recent years. Although there is a large and growing number of researchers in Europe using biotelemetry to study aquatic animals and answer management-related questions, there is a stringent lack of in-field telemetry collaborations in Europe. This situation represents a substantial loss of opportunities for: scientific excellence, funding opportunities and competitively of European SME on the international biotelemetry market. With this Cost Action we want to close this gap and the overarching objective is to ensure a transition from a loosely-coordinated set of existing regional telemetry initiatives to a sustainable, efficient and integrated pan-European biotelemetry network embedded in the international context of already existing initiatives. This will be achieved through working group meetings, workshops, training courses and scientific missions focused on: 1) Implementing a centralized European database, requirements and policy mapped to the data standards of existing international biotelemetry data system, 2) Improve the usefulness and inter-applicability of currently available technology and foster technological advancement, 3) promoting the establishment of key telemetry infrastructure and research on key species, and 4) Provide continuous training opportunities and disseminate knowledge to the stakeholders' community.

Contact person: dr Milica Petković
Period of realization: 2020 – 2024
ID: COST Action CA19111

13. Optical synergies for spatiotemporal SENsing of Scalable ECOphysiological traits (SENSECO)

Description: Vegetated ecosystems largely mediate terrestrial gas and energy exchange at the atmosphere-biosphere-pedosphere interface. The spatial and temporal acquisition of information on vegetation status, health and photosynthetic functioning is fundamental to model the dynamic response of vegetation to changing environmental conditions, necessary for climate change and food security studies. Satellite or airborne Earth Observation (EO) provides the opportunity to collect spatially continuous information of vegetation reflectance globally and at ecologically relevant scales. Optical EO is now advancing towards measuring a signal that is emitted by vegetation (sun-induced chlorophyll fluorescence: SIF). By flying in tandem with Sentinel-3 (S3), ESA's forthcoming FLEX mission will observe SIF, which can, in combination with reflectance, provide an indicator of actual photosynthetic activity. The FLEX-S3 multi-sensor concept exemplifies the synergistic use of multi-source data to capture scalable ecophysiological traits. This, in combination with other Copernicus missions will allow novel data analytical techniques to be realised. Then, by combining these data with proximal sensing from drones and flux towers it becomes possible to address critical open spatiotemporal scaling questions. The synergistic use, processing and interpretation of data from multiple optical instruments at multiple scales have matured to a stage where harmonization across Europe is now possible. This will be achieved by forming the network proposed in this Action and bringing together the Sentinel-2, S3 and FLEX passive EO communities. This Action will therefore develop and further the capabilities for the interpretation of multi-sensor and multi-scale optical measurements and develop common protocols for community use (https://www.senseco.eu/).

Contact person: Doc. dr Branko Brkljač
Period of realization: 2019 – 2022
ID: COST Action CA17134

Erasmus+ Capacity-building projects in the field of higher education' 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.
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1. Business driven problem-based learning for academic excellence in geoinformatics - GEOBIZ

Description: GEOBIZ project consortium built out of 15 academic and 3 business partners together with 5 affiliated partners is addressing partners needs regarding geoinformatics business and academic sector in five European countries: Albania, Bosnia and Herzegovina, Kosovo, Moldova and Montenegro. Geoinformatics ecosystem, as a link between technical and ICT subject and professionals, is part of digital industrial revolution characterized with fast technology driven changes and development of new knowledges and skills necessary for efficient use of this technology for satisfaction of user needs. Rapid change is creating situation in which academic sector faces problems. It can't cope with fast changes and lags in introduction of new content in educational process. This results in situation that new professionals finishing academic education do not master necessary knowledge and skills in field of geoinfomatics and therefore are not well prepared for industry. Ultimately business sector suffers from such situation lacking new experts which can contribute in their development. Therefore, GEOBIZ project aims to design and establish new business-academia cooperation platform in field of geoinformatics in targeted countries which will bring together geoinformatics subjects, foster their cooperation and create situation in which all stakeholders will benefit. Based on this cooperation HEI's will improve quality of education of geoinformatics and related courses using business-driven problem-based cases which are prepared (designed) by geoinformatics companies for use in educational process and thus modernise their geoinformatics courses. This modernisation will result in raising attraction of geoinformatics studies for students, deliver well educated and prepared professional, satisfy needs of business sector for expert work force and ultimately offer to society geoinformatics sector capable to answer on societal needs in efficient, timely and cost benefit manner.

Contact person: Prof. dr Miro Govedarica
Period of realization: 2019 – 2022
ID: 610225-EEP-1-2019-1-HR-EPPKA2-CBHE-JP

2. Strengthening educational capacities by building competences and cooperation in the field of Noise and Vibration Engineering, Environmental Protection and Occupational Safety (SENVIBE)

Description: The wider aim of this SENVIBE project is to improve and build national educational capacities, cooperation and competences in dealing with environmental and occupational noise and vibration (No&Vib) engineering issues in accordance with ongoing EU integration strategies and the needs identified in Serbia.

There are four Specific Project Objectives (SPOs):

SPO1. To modernise existing courses in the field of No&Vib as well as to develop and implement new courses tailor-made for students of undergraduate programmes of six different engineering departments (Environmental Engineering, Occupational Safety Engineering, Mechanical Engineering, Electrical Engineering, Civil Engineering and Traffic Engineering);

SPO2. To create and implement two types of Life-Long Learning (LLL) courses for practitioners in the fields of No&Vib Engineering, Environmental Protection and Occupational Safety;

SPO3. To develop and implement a new MSc programme in Vibro-Acoustic Engineering (VAE), enabling students to strengthen their knowledge and build specific soft skills in three different sub-disciplines: i) Environmental Noise and Vibration, ii) Acoustical Engineering and iii) Vibration Engineering;

SPO4. To establish a No&Vib Hub – a central unit launching and facilitating strategic cooperation among the key stakeholders engaged in No&Vib management: academia, local industry and local and national authorities.

Contact person: Prof. dr Ivana Kovačić
Period of realization: 2018 – 2021
ID: ERASMUS+ KA2

3. Improving the Traffic Safety in the Western Balkan Countries through Curriculum Innovation and Development of Undergraduate and Master Studies (TRAFSAFE)

Description: The wider objective of the project is to improve the quality of higher education in the transport and traffic engineering field, strengthen its relevance for the labour market and society, enhancing the level of competences and skills of experts in WB partner countries (Serbia, Montenegro, Kosovo, Bosnia and Herzegovina) by developing new competence-based and improvement of existing bachelor/master curricula in line with EU trends.

Specific objectives of the project are: 1) to identify key issues of traffic safety in WB partner countries, 2) to develop and implement the new and modern curricula for undergraduate and master studies in accordance with Bologna requirements and national accreditation standards and 3) to develop educational trainings and training material for traffic safety professionals.

What is common for all partner WB universities is that within their existing curricula, which are mostly obsolete, they do not include modern practices in accordance with the technology development, legal environment in the area of transport and traffic engineering as well as student-oriented teaching practices. The most crucial elements of the new curricula will be acquisition of competences in the above-mentioned field.

As a major result of the project, eight modernized and accredited undergraduate/master curricula will be developed, for each of WB partner institutions.

WB HEI's will, in accordance with their needs, develop at least 5 courses on both levels (bachelor and/or master) with 30 ECTS each. Newly developed courses will cover area of Road safety management, Human factor and road safety, Road infrastructure, and safety tools, In-vehicle devices for traffic safety, inteligent traffic system, Traffic information system and Regulation of traffic flows. Also, eight new laboratories will be established with an adequate equipment and manuals.

Contact person: Prof. dr Dragan Jovanović

Period of realization: 2018 – 2021

ID: ERASMUS+ KA2

4. Development of master curricula for Electrical Energy Markets and Engineering Education - ELEMEND

Description: ELEMEND is designed to facilitate electrical engineering curricula in WBC to be competitive through teaching and training in smart gird and microgrid technologies and electricity markets. Courses at the BSc level and a MSc programme will be developed; academic and technical staff will be trained; new ICT tools, such as e-learning platforms and gamified content combined with blended learning, will be used; an internship programme will be put in place for the most motivated of the ELEMEND students; a University – enterprise network will be created within the project, around the core group of the ELEMEND industrial partners. The ELEMEND laboratories will be accessible to all partners and are expected to attract research funding while ELEMEND graduates are expected to have increased employability rates and play a leading role in their field. The student projects carried out in ELEMEND labs in the third project year will focus on real-life problems and are expected to attract the interest of relevant stakeholders. Outputs, such as the e-learning courses, the gamified applications, the virtual labs, the new courses and Master's programme are expected to engage new students and relevant target groups after the lifetime of the project as well as enhance public's awareness. ELEMEND aims to provide, Bosnia & Herzegovina, Serbia, Montenegro and Kosovo* with high profile professionals in intelligent microgrid technologies and emerging electrical energy markets in line with societal and market needs in the Western Balkans. Capacity building in engineering academic staff and students as well as in the general public (through dissemination activities) will create a favourable envirronment for energy related business and will modify the electricity user's behaviour.

Contact person: Prof. dr Platon Sovilj
Period of realization: 2017 – 2021
ID: ERASMUS+ KA2

5. Knowledge triangle for a low carbon economy - KALCEA

Description: In response to the threat of climate change and the global challenges in the Energy sector, countries around the world have pledged to invest in low-carbon energy. Renewable energy sources, storage, smart grids, energy efficiency technologies and more, are some of the key segments which will help in massive decarburization. However, the global challenges in Energy sector cannot be successfully addressed without the contribution of knowledge-based innovations drawing on education and research in Energy field. To successfully respond to these challenges it is necessary to introduce new mechanisms which will connect HEIs with the industry sector and society and produce new innovative solutions. The Knowledge Triangle (KT) paradigm highlights the importance of linking research, education and innovation. Furthermore, to effectively address the challenges in higher education and skill demands, novel training, learning and knowledge transfer schemes are required. KALCEA draws its motivation from the lack of KT mechanisms and structures in WBCs. Cooperation with the industry is weak and on an ad hoc basis, mostly based on individual contacts, while a systematic approach does not exist. KALCEA will establish Knowledge-Innovation Centers (KICs), structrures hosted by selected WBC universities for capacity building in the area of KT; will build strategic partnerships with the industry sector; will develop open innovation platforms based on cooperation; will enable lifelong learning through professional education services in the field of Sustainable Energy through innovative actual and virtual learning environments, such as living labs and learning factories. The KALCEA target groups in HEIs include the administrative, technical and academic staff and PHD students, young researchers in Research Institutions, young professionals, entrepreneurs, and managers in the industry sector.

Contact person: Prof. dr Platon Sovilj
Period of realization: 2020 – 2023
ID: ERASMUS+ KA2

6. Information Security Services Education in Serbia (ISSES)

Description: The goal of the Information Security Services Education in Serbia (ISSES) project is to improve the higher education capacities in the field of information security in the Republic of Serbia. The primary goal of the ISSES project is to develop entirely new courses in advanced cybersecurity topics, which will raise the competitiveness of students graduating at the participating HEIs in Serbia. The secondary project goal is to develop state-of-the-art laboratories which will allow the students to gain hands-on experience directly transferrable to the information security industry. The third goal is to develop new study programs and update existing study programs in the field of information security.

More information about the project can be found at https://isses.etf.bg.ac.rs/

Contact person: Prof. dr Imre Lendak
Period of realization: 2017 – 2021
ID: ERASMUS+ KA2

7. Sustainable University Enterprise Cooperation for Improving Graduate Employability (SUCCESS)

Description: To modernize WBC universities through the strengthening University-Enterprise partnership in the areas of education and knowledge transfer based on the market needs with aim to improve student employability. Furthermore the project aims to enhance international cooperation and networking at the Regional/international level between universities and enterprises.

Contact person: Prof. dr Zoran Jeličić
Period of realization: 2020 – 2023
ID: ERASMUS+ KA2

Visegrad Fund The Fund is an international donor organization, established in 2000 by the governments of the Visegrad Group countries—Czech Republic, Hungary, Poland and Slovakia to promote regional cooperation in the Visegrad region (V4) as well as between the V4 region and other countries, especially in the Western Balkans and Eastern Partnership regions. The Fund does so by awarding €8 million through grants, scholarships and artist residencies provided annually by equal contributions of all the V4 countries. Other donor countries (Canada, Germany, the Netherlands, South Korea, Sweden, Switzerland, the United States) have provided another €10 million through various grant schemes run by the Fund since 2012.

The Conference of Ministers of Foreign Affairs (CM) is the supreme decision making body of the Fund. The conference consists of the Ministers of the Foreign Affairs of the Visegrad Group countries and meets at least once a year in a member state holding the annual rotating presidency. The CM determines the amounts of annual contributions from every V4 member state, approves the rules of procedure of the Fund's secretariat, and approves the Fund's budget.

The Council of Ambassadors (CA) approves projects recommended for funding by the Fund. The council consists of Ambassadors of the V4 member states accredited to the member state which currently holds the presidency of the Conference of Ministers of Foreign Affairs and meets at least once every six months. The CA drafts up programs and documents for the sessions of the Conference of Ministers of Foreign Affairs, ensures monitoring, control, and evaluation of the Fund's operations.

1. Innovations in circular economy – environmental labels and declarations

Description: The role of environmental labelling programs is large and steadily growing globally. Whereas the number of ecolabel schemes, until 2012 was 544 in the world [source: OECD, 2016], simultaneously the common formal educational tools and trained teachers in this field, were lacking. The absence of university courses covering distinctly in a complex way the systems of environmental labels and declarations is the problem in many regions and academia of the Visegrad countries including Rzeszów, Košice, České Budějovice, Győr. The current situation should be changed to benefit from new opportunities addressed by the Circular Economy Package (CEP) of the European Union (EU), a part of a transformation policy towards a new economic system i.e. circular economy. One of such transformation tools are systems of environmental labels and declarations considered as strategies on innovations supporting the business. The open availability of new educational tools and teacher capacity in environmental labelling should increase the awareness of consumers who create demand for ecolabelled goods and are the main determinant of ecolabels diffusion in the EU. The outcomes of the project will result in better effectiveness of enterprises and public administration in Visegrad countries when applying for EU financing. The participation of partner from Serbia should improve the knowledge dissemination among Serbians (consumers, students, and enterprises, especially start-ups) on the EU trends, the compliance of EU standards in Serbian society and finally their competitiveness on the EU markets.

Contact person: Doc. dr Boris Agarski
Period of realization: 2017 – 2021
ID: *VISEGRAD FUND* 21920002

The Interreg IPA Cross-border Cooperation Programme Croatia-Serbia 2014-2020 is a new cooperation programme envisaged to be implemented during financial period 2014-2020. It represents continuation of successful cooperation between two countries established previous financial perspective.

The overall objective of the Interreg IPA Cooperation Programme Croatia-Serbia 2014-2020 is to strengthen the social, economic and territorial development of the cross-border area through the implementation of joint projects and activities to be supported within four priority axes:

- PA1 – Improving the quality of public social and health services in the programme area.
- PA2 – Protecting the environment and biodiversity, improving risk prevention and promoting sustainable energy and energy efficiency.
- PA3 – Contributing to the development of tourism and preserving cultural and natural heritage.
- PA4 – Enhancing competitiveness and developing business environment in the programme area.

Within four priority axes, the Programme defines five specific objectives that indicate specific changes that the Interreg IPA CBC Programme Croatia-Serbia 2014-2020 anticipates to achieve through implementation of specific actions and realization of related outputs.

1. Renewable Energy Sources for Smart and Sustainable Health Centers and University Education – RESCUE

Description: The Renewable Energy Sources for smart sustainable health Centers, University Education and other public buildings – RESCUE, an Interreg - IPA CBC Croatia-Serbia project, aims to promote the use of sustainable energy and energy efficiency in public buildings, particularly in those with high energy demand. By introducing the smart Building Energy Management Systems (BEMS) based on renewable energy sources (RES), RESCUE seeks to demonstrate sustainable, low-carbon solutions for health centers, university education buildings and other public buildings. Lead project partner is Faculty of Technical Sciences Novi Sad – FTN, while the project partners are Clinical Center of Vojvodina – KCV, Faculty of Electrical Engineering, Computer Science and Information Technology Osijek – FERIT, Clinical Hospital Center Osijek – KBCO and Mechanical Engineering Faculty Slavonski Brod – SFSB. Through investment activities beneficiaries will establish RES based BEMS at their public buildings. According to analysis of the available RES potential performed in implementation phase appropriate RES types will be integrated in order to offer clean energy, decrease energy dependency and lower carbon footprint. Expected output is implementation of innovative exemplary facilities for smart RES use and EE measures through establishment of at least 1.7 MW RES based BEMS on public buildings of FTN, KCV, FERIT, KBCO and SFSB. Based on previous experience, available area and current electrical energy demand expected RES types will include photovoltaic (PV) systems of 712,4 kW, wind energy systems of 8 kW, geothermal HVAC systems of 105 kW, solar thermal systems of 54 kW, with addition of RES supply/storage systems of 63 kW. In addition, the integration of PV based assistive devices charging stations, PV based bicycle charging station and electrical vehicle PV based charging station of 5 kW to public buildings BEMS will be performed. The chargers, together with the base functionality, will be adapted to ensure free RES energy, easy access and simple connection of different electrical assistive devices for patients and people with disabilities. Additionally, a smart waste management strategy and system will be devised in order to utilize this abundant, previously unexploited, resource for clean energy production at clinical centers.

Contact person: Prof. dr Boris Dumnić
Period of realization: 2018-2021
ID: HR-RS303

2. Hedging, Stance and Engagement in novice EFL Researchers' Academic Writing

Description: Research on the characteristics of academic writing is attracting increasing attention in the field of language learning due to the fact that an increasing number of academic members will want to publish the results of their scholarly research internationally as a prerequisite for project funding, academic recognition, and advancement. This project aims to analyze the written works of Serbian and Croatian students with the intention of studying and publishing how students as authors of scientific papers present their opinions in their native language (Serbian and Croatian) and in a foreign language (English).

In this regard, we propose the formation of three parallel corps that will represent academic discourse in three languages: Serbian, Croatian and English. The research will examine the functional rather than formal categories of the author's attitude, the author's relationship with the potential reader, and the author's (in) enclosure. These linguistic elements are an important element of scientific communication, and numerous studies have shown that there are subtle but significant differences between native and non-native speakers in the use of expressions of the author's attitude and fencing in academic communication in English. In addition, our goal is to compare several categories in Serbian and Croatian in order to spot cross-lingual differences and compare them with the corresponding categories in English.

This would provide a solid methodological basis for current and future research in academic writing and publishing. This is significant given the view that current methodological frameworks and existing taxonomies are too formalized and therefore cannot be fully applied in a multilingual context.

Contact person: Prof. dr Vesna Bogdanović
Period of realization: 2019 - 2021
ID: 337-00-205/2019-9/25

The Danube Transnational Programme is a financing instrument of the European Territorial Cooperation (ETC), better known as Interreg. ETC is one of the goals of the European Union cohesion policy and provides a framework for the implementation of joint actions and policy exchanges between national, regional and local actors from different Member States.

The Danube Transnational Programme (DTP) promotes economic, social and territorial cohesion in the Danube Region through policy integration in selected fields.

In order to achieve a higher degree of territorial integration of the very heterogeneous Danube region, the transnational cooperation programme acts as a policy driver and pioneer to tackle common challenges and needs in specific policy fields where transnational cooperation is expected to deliver tangible results.

Considering its geographical coverage, this highly complex programme provides a political dimension to transnational cooperation which is unique in Europe, successfully facing challenges such as ensuring good mechanisms to contract partners who receive funding from different EU instruments.

The Danube Transnational Programme finances projects for the development and practical implementation of policy frameworks, tools and services and concrete small-scale pilot investments. Strong complementarities with the broader EU Strategy for the Danube Region (EUSDR) are sought.

1. Transnational Cluster Cooperation active on Agro – food, based on Smart Specialization Approach in Danube region - DANUBE S3 CLUSTER

Description: The project addresses the major territorial challenge of the Danube area – the unbalanced distribution of innovation performances between Western part of the region with a high level of development and the Eastern part that is lagging behind, most of the countries belonging to the Modest Innovators group with more than 17% of enterprises producing only 3% of added value. This is due to different framework conditions and wide range of policies governing the R&I sector. Public policies in the area should be better coordinated while investment needs to be smarter and better focused. This is why cluster cooperation policies based on the smart specialization concept are at the core of delivering the EUSDR strategy, as they help take the geographical and thematic context into account in order to boost growth.

The project aims to leverage the innovation-driven entrepreneurial ecosystem in the Danube area by developing smart and coordinated cluster policies in the context of RIS3, enhance innovation management knowledge and skills and foster transnational cluster cooperation in Agro-Food sector. The sector has been selected since it is a priority area of the RIS3 in the partner regions and it is among the priorities selected for the Danube area by the JRC. The project aims to generate a significant change by developing Danube S3 Cluster Strategy and Programme based on Quadruple Helix involvement as transnational strategic documents focused on exploiting the linkages between mutually reinforcing specialization areas across sectors. The strategy will be tested by 5 pilot initiatives in 4 cross-cutting themes (market intelligence, open innovation, business models for circular economy and healthy food) that are interconnected and able to generate new innovative project ideas and feeding into EUSDR. The pilots will be implemented in HR, RS &SK and especially in MD& UA where most of the knowledge generator activities will take place, for a better coordination of cluster policies.

Contact person: Prof. dr Milan Martinov
Period of realization: 2018 – 2021
ID: DANUBE INTERREG

2. LIVING DANUBE LIMES Valorising cultural heritage and fostering sustainable tourism by LIVING the common heritage on the DANUBE LIMES as basis for a Cultural Route

Description: The project focuses on connecting, enlivening, researching, preserving and highlighting the Roman Danube Limes as transnational cultural heritage of enormous significance, in order to create a sound foundation for a future European Cultural Route. The partner consortium consists of 19 project partners and 27 associated strategic partners from Germany, Austria, the Czech Republic, Slovakia, Hungary, Croatia, Serbia, Bulgaria, Romania and the Republic of Moldova. Main objective of the project is the connection of the Danube region through its common Roman heritage. The project seeks to support its preservation through the creation of consciousness for the value of common heritage, while respecting local differences, particularities, and creating sensibility, that the Roman Danube Limes was not just a border fortification network, but also a vast trading zone with a lot of mobility. The project supports the UNESCO World Heritage nomination of the entire Danube Limes, specially focusing on the nomination process for Croatia, Serbia, Romania and Bulgaria. Another main objective of the project is laying the foundations for a future European Cultural Route traversing the entire Danube Region. The fostering of sustainable and eco-friendly tourism through tourism strategies specifically created for the Danube Limes region is another prime objective of Living Danube Limes. The project will establish eight national pilot-sites with regular public activities such as livinghistory events and workshops on historic crafting methods. Physical reconstructions at the pilot-sites will complement the virtual reality reconstructions and invite more interest and should lead to follow-up projects and investment at the site. Workshops for the dissemination of historic crafting techniques will be organised and documented. A living-history cruise from Germany to the Black Sea, with international living-history groups steering the reconstructed Roman ship of the 4th century AD, will be organised at the end of the project. The ship and its crew will be halting at each pilot-site in order to participate in a livinghistory festival there, which will further allow for a large array of interactions with the public.

Contact person: Prof. dr Milena Krklješ
Period of realization: 2020 – 2022
ID: DANUBE INTERREG

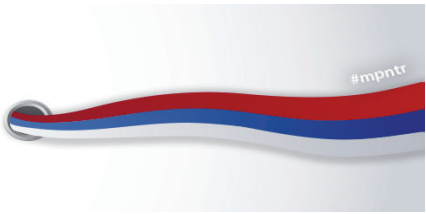
3. F(ol)low the Plastic from source to the sea: Tisa-Danube integrated action plan to eliminate plastic pollution of rivers - Tid(y)Up

Description: Despite the advanced waste management and ambitious recycling objectives of the EU, studies indicate the presence of plastic and microplastic pollution in rivers of CE. From a water quality perspective, it is a challenge to prevent this new threat. For this reason, Tid(y)Up project is focusing on the improvement of water quality and reduction of plastic pollution of the Tisa river from its source to the Black Sea. Currently there are no standard methods and consistent data available on plastic pollution of rivers in the Danube Basin that would help harmonized actions of water management authorities and allow cooperation with other sectors necessary to stop the pollution. Within the project partners develop and launch a set of integrated actions, consult and provide tools for relevant stakeholders and initiate long term transboundary and intersectoral cooperation with the aim of eliminating the plastic pollution of rivers.

The project operates with a list of diverse tools including scientific actions to standardize methods for estimation of the size of pollution, formulating recommendations toward a standardized measurement and analyzing method, on-site expeditions, pilot-actions for identification and clean-up of polluted areas and sources, as well as education and awareness raising actions for the prevention. The novelty of the project is that it provides tools, data and the assessment of various used methodology for understanding of the sources, nature and risks of contamination flows; and delivers practical examples of possible actions and legislative solutions both on local and transnational level. The key focus is to gather all necessary information, raise awareness of the relevant actors and provide them with practical tools in order to create active, co-operating communities in the fight against the plastic waste contamination and contribute to the work of water authorities to improve water quality by also providing input for the upcoming revision of DRBMP.

Contact person: Prof. dr Dejan Ubavin
Period of realization: 2020 – 2022
ID: *DTP3-620-2.1* DANUBE INTERREG

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 (NIO) on the basis of international bilateral agreements.

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

SERBIA – SLOVENIA

1. **Readiness of Slovenian and Serbian manufacturing companies for Industru 4.0**
   Contact person: Prof. dr Bojan Lalić
   Period of realization: 2020 – 2021

SERBIA - FRANCE

2. Problem pristupa mreži u masovnom Internetu Stvari

Contact person: Prof. dr Dejan Vukobratović
Period of realization: 2020 – 2021

SERBIA – CRNA GORA

3. ECO AWAKE

Contact person: Prof. dr Vlastimir Radonjanin
Period of realization: 2019-2021

SERBIA – GERMANY

4. Memristors: from fabrication to IC design

Contact person: Doc. dr Nataša Samardžić
Period of realization: 2020-2021

Key Action 1: Mobility of Individuals

This Action is all about providing opportunities for individuals to improve their skills, enhance their employability and gain cultural awareness.

Under Key Action 1 organizations can apply for funding to run mobility projects to enable organizations to offer structured study, work experience, job shadowing, training and teaching opportunities to staff and learners.

Beneficiaries are able to spend a period of time in another participating country gaining valuable experience of life, study and work with the aim of increasing the opportunities available to them in the future.

Key Action 1 covers the five fields of higher education, vocational education and training, schools, adult education and youth. It is important to note that target groups and activities for Key Action 1 vary by field.

Key Action 1 is the largest action in Erasmus+ with 63% of programme budget supporting its focus on increasing mobility and skills.

AUSTRIA

1. TU GRAZ
2. FC CAMPUS 2- UNIVERSITY OF APPLIES SCIENCE, GRAZ

BULGARIA

4. South-West University
"Neofit Rilski", Blagoevgrad

FRANCE

5. ECOLE NATIONALE SUPERIEURE DES ARTS ET INDUSTRIES TEXTILES, ROUBAIX

GREECE

6. UNIVERSITY OF THE AEGEAN, MYTILENE

CROATIA

7. JOSIP JURAJ STROSSMAYER UNIVERSITY, OSIJEK
8. UNIVERSITY OF APPLED SCIENCE, ZAGREB
9. BUSINESS SCHOOL PAR, RIJEKA

ITALY

10. POLITECNICO DI MILANO
11. UNIVERSITY OF PALERMO
12. UNIVERSITZ OF CATANIA

LITHUANIA

13. KAUNAS UNIVERSITY OF TECHNOLOGY - KTU

HUNGARY

14. BME, BUDAPEST
15. JOHN VON NEUMANN UNIVERSITY, KECSKEMET

GERMANY

16. ULM UNIVERSITY OF APPLIED SCIENCES
17. SRH UNIVERSITY HEIDELBERG
18. FREIE UNIVERSITY, BERLIN
19. CLAUSTHAL UNIVERSITY OF TECHNOLOGY

POLAND

20. BIALYSTOK UNIVERSITY OF TECHNOLOGY
21. TECHNICAL UNIVERSITY OF LODZ
22. KRAKOW UNIVERSITY OF TECHNOLOGY

PORTUGAL

23. POLITECHNIC UNIVERSITY CASTELO BRANCO

ROMANIA

24. TRANSILVANIA UNIVERSITY OF BRAȘOV
25. POLITEHNIKA TIMISOARA

SLOVAKIA

26. SLOVAK UNIVERSITY OF TECHNOLOGY BRATISLAVA

SLOVENIA

27. UNIVERSITY OF MARIBOR
28. UNIVERSITY OF LJUBLJANA

SPAIN

29. REY JUAN CARLOS UNIVERSITY
30. POLYTECHNIC UNIVERSITY OF VALENSIA
31. POLYTECHNIC UNIVERSITY OF CATALONIA

TURKEY

32. OZYEGIN UNIVERSITY, ISTAMBUL
33. AKSARAY UNIVERSITY

CZECH REPUBLIC

34. BRNO UNIVERSITY OF TECHNOLOGY
35. UNIVERSITY OF PARDUBICE

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