

7th Framework Programme projects

621386: ERACHair - Enhancing Research and innovAtion dimension of the University of Zilina in intelligent transport (ERAdiate)	
Summary:	The ERAdiate project is aimed at unlocking and strengthening the research potential and promoting excellence of the University of Zilina (UNIZA) as well as the Zilina region in the field of Intelligent Transport Systems (ITS). Systematic development of human resources, effective exploitation of unique research infrastructures and advanced transformations of the institution steered towards enhanced competitiveness in the European Research Area (ERA) are the key instruments to reach the ERAdiate goals. The project focuses on sustainable development of human resources and key competences under leadership of an experienced scientist and manager, an ERA Chair Holder, and his team. Major challenges such as creating competitive environment, increasing of critical mass of excellent researchers, significant improvement of the UNIZA performance in competitive research funding, implementation of the ERA culture, contribution to growth and jobs based on the SMART specialization strategies, are addressed.
Realization:	07/2014 – 07/2019
Coordinator:	Milan Dado (DMICT), Jadrslav Janoušek (DEBE)
Co-operators:	Juraj Machaj (DMICT)

607361: ADvanced Electric Powertrain Technology „ADEPT“	
Summary:	The goal of the ADEPT program is to produce a virtual development environment for E-propulsion systems and to train and establish a multi-disciplinary research network. The ADEPT program will raise the profile and to improve career perspectives for 12 ESRs, and 2 ERs, offering a high-quality structured consortium providing personalized training opportunities in E-propulsion systems and in complementary skills (i.e. entrepreneurship). An intimate involvement in all aspects of the collaboration (research, knowledge transfer, secondments, workshops) along with an extensive training program in a wide range of fields (electromagnetics, thermal, mechanical, vibro-acoustic, control, vehicle integration of E-propulsion) will allow early-stage and experienced researchers to develop the technical proficiency and complementary skills required to make significant contributions to their professional careers. Through industry-academia partnerships, ADEPT will facilitate the uptake of scientific results in E-propulsion and industrial products and solutions.
Realization:	07/2014 – 06/2017
Coordinator:	Technische Universiteit Eindhoven, Netherlands
Subcoordinator from FEE	Pavol Rafajdus (DPES)

Horizon 2020

MSCA-RISE-2016: SENSors and Intelligence in BuILt Environment SENSIBLE	
Summary:	The goal of this project is to develop novel information sensing research and innovation approaches for acquiring, communicating and processing a large volume of heterogeneous datasets in the context of smart buildings, by building an international, inter-disciplinary and inter-sectoral collaboration network through research and innovation staff exchanges and seamless exchange of ideas, expertise, data, testbeds, and know-how. The need to sense and process ever increasing amount of data requires

	<p>novel engineering that goes far beyond conventional centralised methods, where signal acquisition, communications and data processing are performed centrally and independently. Building on integrating signal acquisition, communications and information extraction into an overarching smart sensing approach, the project will provide a holistic decision support framework for non-residential buildings of the future.</p> <p>The key challenges of providing intelligence to the building lie in ubiquitous sensing, inside and outside the building, and connecting the sensing technology to people and outside world via meaningful decision support. Though significant research has been dedicated to developing novel sensing and instrumentation technologies, further research and innovation advances are needed to integrate physical sensing to data processing via distributed estimation and fusion approaches, giving actionable meaning to the suite of collected data. In that context, it is necessary not only to continuously monitor the environment, equipment, systems and processes, but also to sense occupants' behaviour inside and outside the building and provide timely response and feedback.</p>
Realization:	01/2017 – 12/2020
Coordinator:	Vladimir Stankovic, University of Strathclyde, Glasgow, UK
Sub-Coordinator from FEE:	Juraj Machaj (DMICT)
Co-operators:	Milan Dado, Slavomír Matúška, Róbert Hudec, Peter Brída (DMICT), Jarmila Müllerová (IAS), Peter Holečko, Michal Gregor, Vojtech Šimák (DCIS)

636537 - H2020 High precision positioning for cooperative ITS applications	
Summary:	<p>This project addresses the problems by combining traditional satellite systems with an innovative use of on-board sensing and infrastructure-based wireless communication technologies (e.g., Wi-Fi, ITS-G5, UWB tracking, Zigbee, Bluetooth, LTE...) to produce advanced, highly-accurate positioning technologies for C-ITS.</p> <p>HIGHTS platform will be a key enabler to C-ACC and Platooning. In particular C-ACC and Platooning will provide smoother driving conditions, optimization of traffic flows and high precision lane detection for more efficient guidance in urban and highway environments.</p> <p>The platform will increase the safety level of vulnerable road users (motorcycles, scooters, pedestrians) through bi-directional danger detection and by detecting slight deviations from driving courses, thus detecting danger before it occurs.</p> <p>The results will be integrated into the facilities layer of ETSI C-ITS architecture and will thereby become available for all C-ITS applications, including those targeting the challenging use cases Traffic Safety of Vulnerable Users and Autonomous Driving/platooning. The project will therefore go beyond ego- and infra-structure-based positioning by incorporating them as building blocks to develop an enhanced European-wide positioning service platform based on enhanced Local Dynamic Maps and built on open European standards.</p>
Realization:	05/2015 – 04/2018
Coordinator:	Stefano Severi, Jacobs University Bremen gGmbH, Germany
Subcoordinators from FEE	Peter Brída, Juraj Machaj (DMICT)

COST projects

Action IC 1304: Autonomous Control for a Reliable Internet of Services “ACROSS”	
Summary:	Currently, we are witnessing a paradigm shift from the traditional information-oriented Internet into an Internet of Services (IoS). This transition opens up virtually unbounded possibilities for creating and deploying new services. Eventually, the ICT landscape will migrate into a global system where new services are essentially large-scale service chains, combining and integrating the functionality of (possibly huge) numbers of other services offered by third parties, including cloud services. At the same time, as our modern society is becoming more and more dependent on ICT, these developments raise the need for effective means to ensure quality and reliability of the services running in such a complex environment. Motivated by this, the aim of this Action is to create a European network of experts, from both academia and industry, aiming at the development of autonomous control methods and algorithms for a reliable and quality-aware IoS.
Realization:	11/2013 – 11/2017
National delegate:	Peter Počta (DMICT)

Action TU 1302: Satellite Positioning Performance Assessment for Road Transport “SaPPART”	
Summary:	Global Navigation Satellite Systems (GNSS) have a significant potential in the development of ITS and mobility services, expected to deliver many benefits including reducing congestion, increasing capacity and improving safety. The road sector is estimated to represent more than 50% of the GNSS market and 75% when we consider the mobility services on smartphones. However, the current lack of a pan-European certification process underpinned by agreed standards is impeding the realisation of the expected benefits. The main reason for this is the complexity of defining and assessing GNSS performance which is highly influenced by the environment and operational scenario. Although standardisation activities have been initiated in Europe on this topic, many scientific issues are still open and require a common agreement. This Action brings together experts in GNSS, ITS and mobility to address the open issues and guarantee the success of the standardisation for underpinning certification initiatives. The Action will provide 4 deliverables and will propose a unified framework for definition and assessment of performance for the GNSS-based positioning terminals. This framework is expected to pave the way for certified terminals, which is expected to result in a significantly accelerated use of GNSS-based ITS and mobility applications.
Realization:	11/2013 – 11/2017
Coordinator:	Peter Brída (DMICT)
Co-operators:	Juraj Machaj (DMICT)

Action IC1407: Advanced characterisation and classification of radiated emissions in densely integrated technologies (ACCREDIT)	
Summary:	The electromagnetic interference (EMI) will increase with the anticipated increase of clock speeds, frequency of operation and circuit density. Immunity levels will also decrease due to lower supply voltages and lower signal power levels. Traditionally the potential EMI sources were assessed in the frequency domain assuming static emissions.
Realization:	04/2015 –09/2019

Coordinator:	David Thomas, University of Nottingham
Co-operators:	Darina Jarinová (DMICT)

Action IC 1303: Algorithms, Architectures and Platforms for Enhanced Living Environments “AAPELE”	
Summary:	This Action aims to promote interdisciplinary research on AAL, through the creation of a research and development community of scientists and entrepreneurs, focusing on AAL algorithms, architectures and platforms, having in view the advance of science in this area and the development of new and innovative solutions.
Realization:	11/2013 – 11/2017
Coordinator:	Peter Počta (DMICT)

Action CA 15104: The Inclusive Radiocommunications (IRACON)	
Summary:	This COST Action aims at scientific breakthroughs by introducing novel design and analysis methods for the 5th-generation (5G) and beyond-5G Radiocommunication networks. Challenges include i) modelling the variety of radio channels that can be envisioned for future inclusive radio, ii) capacity, energy, mobility, latency, scalability at the physical layer and iii) network automation, moving nodes, cloud and virtualisation architectures at the network layer, as well as iv) experimental research addressing Over-the-Air testing, Internet of Things, localization and tracking and new radio access technologies.
Realization:	03/2016 – 03/2020
Coordinator:	Juraj Machaj (DMICT)
Co-operators:	Peter Brída (DMICT)

Action MP1401: Advanced fibre laser and coherent source as tools for society, manufacturing and lifescience	
Summary:	Fibre lasers are in the class of rapidly developing lasers with many applications for several reasons. Within the Action we expect an increase of innovations in this field, in particular the coverage of wavelengths from 3 to 6 micrometers, applications in the near-infrared region and increase of output transmission of fibers for a better coverage of visible and ultraviolet regions for biophotonics and improvement of health care.
Realization:	12/2014 - 12/2018
Coordinator:	Daniel Káčik (DPh)
Co-operators:	Ivan Martinček, Dušan Pudiš, Norbert Tarjányi (DPh)

Action BM 1309: European network for innovative uses of EMFs in biomedical applications “EMF-MED”	
Summary:	The Action will provide a cooperative framework to support the research on beneficial biological effects of non-ionizing electromagnetic fields (EMFs) and their use in biomedical applications. Research on biological effects of EMFs has traditionally focused on health risks. Inspired by promising recent studies on useful biomedical EMF interactions and applications, this Action will focus on beneficial effects, aiming for breakthrough results, new discoveries and innovative biomedical technologies. The Action will provide a better understanding of underlying physical and biological interaction mechanisms, related to both cancer and non-cancer applications, filling the gaps in the present state of knowledge. Ultimately, the Action will aim to contribute to development and optimization of innovative EMF-

	based medical devices and procedures, which will be safer, more efficient and less invasive. Interdisciplinary of the proposed topic and significance of the expected outcomes require a concerted research network at the European level.
Realization:	04/2014 – 04/2018
Coordinator:	Ján Barabáš (DEBE)
Co-operators:	Roman Radil (DEBE)

Action CA15213: Theory of hot matter and relativistic heavy-ion collisions

Summary:	This COST Action „Theory of hot matter and relativistic heavy-ion collisions“ (THOR) creates a theoretical community platform counterpart to the ongoing vigorous exceptional potential in this field of theoretical research. THOR will pioneer novel approaches to the theoretical understanding of the properties of QCD from first principles and on the interpretations of these properties by effective models and numerical simulations of the system's evolution. By this, THOR will provide new insights on the paramount questions of the field. Therefore THOR aims at bringing together excellent researchers in order to pinpoint and discuss the challenges that the field meets currently and in the near future for creating a vibrant, innovative and world-leading pan-European research environment.
Realization:	10/2016 - 16/2020
Coordinator:	Marcus Bleicher, Frankfurt
Co-operators:	Ivan Melo (DPh)

TU 1305: Social networks and travel behaviour

Summary:	COST Action TU1305 aims to initiate a new collaboration framework for the various EU research groups that develops a new transport paradigm based upon ICT social networks and their subsequent travel behaviour in the urban environment. Our goals are to explore ways in which social activities become mobilised in space, identify how social ties affect the integration of local public transport into urban patterns, and develop a rigorous conceptual framework for new ideas and methodologies.
Realization:	03/2014 – 03/2018
Coordinator:	Pnina Plaut, Technion, Israel Institute of Technology, Haifa, Israel
Co-operators:	Peter Holečko (DCIS), Rein Ahas, Sven Kesselring, Isabelle Thomas, Lucia Cristea, ...

ERASMUS projects

2014-BE02-KA200-000462: Strategic Partnership: Early identification of STEM readiness and targeted academic interventions (readySTEMgo)

Summary:	Early identification of problems in STEM (Science-Technology-Engineering-Mathematics) education especially for the first year technical university students and search for ways to help improve the current state.
Realization:	10/2014 – 09/2017
Coordinator:	Greet Langie (KU Keulen)
Co-operators:	Peter Hockicko, Gabriela Tarjániová, Marián Janek (DPh)

International Scientific and Technological Co-operation Projects (MVTs)

RSF 14-49-00079: New methods and algorithms of combined signal and image processing with unknown parameters in promising radars and communication systems	
Summary:	The project solves the issue at the Moscow Energy Institute at the National Research University within the Department of Radio Equipment and Antenna systems.
Realization:	10/2014 – 12/2017
Coordinator:	Yurij Kutojans, Univerzita Le Mans, France
Co-operator:	Branislav Dobrucký (DME)

Other International Research Projects

02–1-1097-2010/2018: Study of polarization phenomena and spin effects at the Nuclotron accelerator (JINR)	
Summary:	The project's aim is to study the spin structure of light nuclei and the mechanism of reactions in which they participate in the inner target of the Nuclotron as well as in the extracted beam in the region of medium energies.
Realization:	01/2017 - 31/2017
Coordinator:	Marián Janek (DPh)
Co-operators:	Marek Veveričík (DPh)

Technical safety of the GP JAZZ	
Summary:	There are cases of controlled processes, which can threaten the assets located within their scope. Currently, the safety of a controlled process is evaluated indirectly by the evaluation of safety integrity of the control system. An important operation during the evaluation of the safety of a control system is the evaluation of failures effects on its safety and that of on the safety of the controlled process.
Realization:	11/2017 – 12/2018
Coordinator:	Karol Rástočný (DCIS)

Other International Non-research Projects

EPPCN Agreement KE3202/EPPCN	
Summary:	The EPPCN Member (Ivan Melo) acts as CERN's communications point of contact in the Member State or Associate Member State in which he/she resides and cooperates in the promotion of CERN's mission and the demonstration of its importance at the national level.
Realization:	01/2017-12/2020
Coordinator:	Arnaud Marsolier, CERN
Co-operators:	Ivan Melo (DPh)

PROJECT of the EUROPEAN PHYSICAL SOCIETY INTERNATIONAL PHYSICS MASTERCLASSES 2017	
Summary:	High school students spend one day with physicists of elementary particles during which they learn to evaluate real experimental data from the LHC accelerator.
Realization:	annually
Coordinator:	Ivan Melo (DPh)
Co-operators:	Gabriela Tarjániová, Mikuláš Gintner, Beáta Trpišová, Jozef Kúdelčík, Juraj Remenec (DPh)