

7th Framework Programme projects

621386: Enhancing Research and innovAtion dimension of the University of Zilina in intelligent transport systems „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 (DTM), Jadrslav Janoušek (DEBE)

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

636537 - H2020 High precision positioning for cooperative ITS applications	
Summary:	This project addresses the problems by combining traditional satellite systems with an innovative use of on-board sensing and infrastructure-based wireless

	<p>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 (DTM)

#### EUREKA projects

E! 6752: R&D For Integrated Artificial Intelligent System For Detecting The Wildlife Migration "DETECTGAME"	
Summary:	Integrated artificial intelligent system for detecting the wildlife migration that will utilise video surveillance technology with computer vision technology, that will provide gov. structural and eco. organisations with accurate data about wildlife migration for optimising road network.
Realization:	09/2013 - 06/2016
Coordinator:	Róbert Hudec (DTM)

#### COST projects

Action IC 1102: Integrating Biometrics and Forensics for the Digital Age	
Summary:	Goal of the COST Action is networking of European institutions focused on research of process for biometrics and forensics analysis with utilization of new progressive analysis technologies and processing of multimodal data. DTaM research team is oriented in research of algorithms for persons identification and recognition their emotive status from acoustic data. They are also focused on detection and recognition of specific audio events from digital content.
Realization:	03/2013 – 03/2016
Coordinator:	Roman Jarina (DTM)

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 (DTM)

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 (DTM)
Co-operators:	Juraj Machaj (DTM)

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)

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 (DTM)

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)

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 (DTM)
Co-operators:	Peter Brída (DTM)

CA COST Action CA15213: Theory of hot mater and relativistic heavy-ion collisions
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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, Izrael)
Co-operators:	Peter Holečko (DTM), Rein Ahas, Sven Kesselring, Isabelle Thomas, Lucia Cristea, ...

#### TEMPUS Projects

530632-TEMPUS-1-2012-1-SE-TEMPUS-JPCR: EU-EG-JO Joint Master Programme in Intelligent Transport Systems “JOINITS”	
Summary:	The project focuses on establishing a new study programme and equipment of ITS laboratories on target universities in Egypt and Jordan. The project will enable to organise a joint conference on the ITS area, realise a mutual exchange of students and teachers and deepen the bonds between universities and business.
Realization:	11/2012 – 10/2015
Coordinator:	Ghazwan Al-Haji, Linköping University, Finland
Subcoordinator from FEE	Peter Brída (DTM)

#### ERASMUS projects

2014-BE02-KA200-000462: Strategic Partnership: Early identification of STEM readiness and targeted academic interventions (readySTEMgo)	
Summary:	Goal is to identify causes of the first year university STEM (Science-Technology-Engineering-Mathematics) students drop-out and search for ways to help improve the current state.

Realization:	10/2014 – 09/2017
National coordinator:	Peter Hockicko (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
Co-operator:	Branislav Dobrucký (DME)

18171 Effective description of electroweak symmetry breaking – investigation of resonances	
Summary:	Project supports collaboration with Dr. Josef Juráň (Silesian University in Opava, Czech Republic) on formulation of effective Lagrangians with the lightest hypothetical resonances expected in composite scenarios of theories beyond the Standard model. Integral part of this programme is the search for direct and indirect experimental limits on free parameters of such effective description.
Realization:	01/2016 – 12/2016
Coordinator:	Mikuláš Gintner (DPH)

#### Other international projects

ETSI STF 504: Detection of Emotions in Telecommunication Measurement Applications	
Summary:	Since some years Emotion Detectors are in use, however, all of them are designed for very special purposes. Emotion Detector for telecommunication measurements has not been defined so far, neither for written text nor for spoken sentences. Despite the rapid development and increase usage of those Emotion Detectors, no systematic classification or even standardization of input and output parameters, related terminology and minimum requirements exist, not in general and not for the subject telecommunications as well. There is also very little agreement on their certain parameters and input and output variables, usually are based on social psychology or psycho-acoustics. It is proposed to work on these non-standardized items and to fill the gap in order to provide basic standardization framework for this kind of technology, which is needed for standards in the emerging domain of extended voice bandwidth. The emotion detection is a promising tool that can, among other things, help to identify suitable (emotion-free) test sentences for subjective testing of multimedia transmission quality.
Realization:	10/2015 – 07/2016
Coordinator:	Peter Počta (DTM)

PROJECT of EUROPEAN PHYSICAL SOCIETY INTERNATIONAL PHYSICS MASTERCLASSES 2016 <a href="http://www.physicsmasterclasses.org">http://www.physicsmasterclasses.org</a>	
Summary:	High school students spend one day with physicists of elementary particles during which they learn to evaluate real experimental data from LHC

	accelerator.
Realization:	annually
National coordinator:	Ivan Melo (DPh)

EPPCN Agreement KE2218/EPPCN	
Summary:	The EPPCN Member (Ivan Melo) acts as CERN's communication 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:	01/2013-12/2016
Coordinator:	Ivan Melo (DPh)

02-1-1097-2010/2016: 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:	01/2016 - 12/2016
Coordinator:	Marián Janek (DPh)
Co-operators:	Gabriela Tarjányiová (DPh)

1/2016: Safety assessment of track interlocking device RLC23	
Summary:	Agreement on research activities between Altpro d.o.o. Zagreb (Croatia) and UNIZA. The goal is the safety appraisal of RLC23 system related with its implementation on the track Martin – Vrútky (in rkm 306,077).
Realization:	05/2016 – 11/2016
Coordinator:	Karol Rástočný (DCIS)

Osaka University and Japan Society for the Promotion of Science: The research of the properties of nano-structured SSCT layers on Si, 2016	
Summary:	The project solved at DFCM ISIR Osaka University, Japan was targeted on the research of the properties of microstructure and surface morphology of nanostructured SSCT (Surface Structure Chemical Transfer) layers. Studied layers were formed by several different technological operations for applications in the solar cell production. Analytical methods were based on the electron microscopy, Raman scattering, spectral ellipsometry, UV-VIS and FTIR spectrometry. Experimental results were analysed by the SPM methods, multifractal, Fourier and statistical methods and by modelling of optical interactions by the VIMSO method. Additional research was targeted on the photon interactions in a system of nc-Si – organic molecule DMA. Results of the project create a platform for the collaboration with Japan laboratories in the future.
Realization:	09/2016 – 10/2016
Coordinator:	Stanislav Jurečka (IAS)