

Research and Development Projects for Young Researchers

COMPLEX-VALUED DEEP NEURAL NETWORKS

Goal of the project

Three types of complex-valued deep neural networks will be proposed: complex-valued convolutional neural networks, complex-valued deep belief networks and long short term memories, which will be applied for image recognition and time series prediction with real values and with complex values.

Short description of the project

The project aims to extend deep neural networks to the complex domain, and use the resulting complex-valued deep neural networks for real- and complex-valued image recognition and time series prediction.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

The main activities of the project are:

- Development and application of deep complex-valued convolutional neural networks,
- Development and application of complex-valued deep belief networks,
- Development and application of complex-valued long short term memories,
- Dissemination of the results and support of the research activities.

Results

The main results of the project were: 5 papers in ISI conferences:

- **3 at the International Symposium on Neural Networks (ISNN)**, Minsk, Belarus, 2018:
 1. C.-A. Popa, C. Cernăzanu-Glăvan, Fourier Transform-Based Image Classification Using Complex-Valued Convolutional Neural Networks;
 2. C.-A. Popa, Complex-Valued Stacked Denoising Autoencoders;
 3. C.-A. Popa, Complex-Valued Deep Belief Networks;

- **2 at the International Joint Conference on Neural Networks (IJCNN)**, Rio de Janeiro, Brazil, 2018:

1. C.-A. Popa, Deep Hybrid Real-Complex-Valued Convolutional Neural Networks for Image Classification;
2. C.-A. Popa, Complex-Valued Deep Boltzmann Machines;

- **and 2 papers in ISI journals:**

1. C.-A. Popa, Deep Hybrid Real-Complex-Valued Residual Networks, IEEE Access, IF 3.557, Q1;
2. C.-A. Popa, Global μ -Stability of Neutral-Type Impulsive Complex-Valued BAM Neural Networks with Leakage Delay and Unbounded Time-Varying Delays, Neurocomputing, IF 3.241, Q1.

Applicability and transferability of the results:

The results are applicable in the radar imaging and the functional magnetic resonance imaging domains, which both produce complex-valued images, where complex-valued neural networks can have better results than their real-valued counterparts. Wind speed and direction prediction is a complex-valued time series prediction problem, for which the proposed complex-valued neural networks may also have a positive impact. As such, the results can be interesting for the military, medical, and metrological domains.

Research team

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TENSOR PRODUCT MODEL TRANSFORMATION-BASED ADAPTIVE CONTROL TECHNIQUES WITH MECHATRONICS APPLICATIONS

Goal of the project

The main goal of this project was the analysis, the development and the validation of the control algorithms, which combines new tensor product model transformation-based design techniques, fuzzy control and adaptive control. The exploitation and dissemination of results in the refereed journals and in refereed academic conferences.

Short description of the project

Derivation of LPV models of mechatronics applications using TP-based model transformation. Mixed TP-based and adaptive control algorithms are designed for the control of laboratory equipment.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

1. The analysis, development and implementation of new Tensor Product model transformation-based design techniques.
2. The development of mixed control algorithms by the combination of new Tensor Product based model transformation fuzzy control and gain scheduling control. The stability analysis of the closed-loop control systems.
3. The exploitation and dissemination of results, the publication of papers in high impact leading journals. The participation and presentation of papers to important conferences. The continuous development of international partnerships.
4. The management of activities.

Results

The main results of the project were:

- Bojan-Dragoş et al., Gain-Scheduling Control Solutions for Magnetic Levitation Systems, APH
- Hedrea et al., TP-Based Model Transformation Technique Applied to Modeling Vertical Three Tank Systems, SACI2018
- Bojan-Dragoş et al., Control Solutions for Vertical Three-Tank Systems, SACI2018

- Szedlak-Stinean et al., Feedback Control Solutions for an Electromechanical Process with Rigid Body Dynamics, SACI2018
- Szedlak-Stinean et al., Gain-Scheduling Control Solutions for a Strip Winding System with Variable Moment of Inertia, PID2018
- Hedrea et al., Comparative Study of Control Structures for Maglev Systems, PEMC2018
- Hedrea et al., Cascade Control Solutions for Maglev Systems, ICSTCC2018
- Bojan-Dragoş et al., Gain-Scheduling Position Control Approaches for Electromagnetic Actuated Clutch Systems, ICINCO2018.

Applicability and transferability of the results:

New TP fuzzy techniques can lead to automatic tools for controller design and tuning in several control system structures. All mechatronics applications tackled in the project are interdisciplinary and multidisciplinary themselves. The new TP fuzzy techniques proposed in this project are dedicated to process control in many industry areas which are managed by the team partners.

Research team

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NEW MATERIALS CHEMICALLY MODIFIED USED FOR ARSENIC ADSORPTION FROM WATER

Goal of the project

The goal of the project is to obtain advanced materials functionalised with crown ethers which could be efficiently used in the removal process of arsenic from waters.

Short description of the project

In full accordance with the principle of sustainable development, the project presents a new concept for arsenic removal treatment of drinking water, using innovative systems involving new adsorbent materials. Why arsenic? Because arsenic is a national and worldwide problem. At the same time its toxicity is well known. Also, in the developing countries the underground waters represent the main source of drinkable water and their contamination with arsenic compounds is a problem that must be solved. There are many methods of arsenic removal from drinking water, like filtration, precipitation, coagulation, electrocoagulation, invers osmoses and ion exchange.

Adsorption is one of the most commonly method reported. Adsorption processes involving arsenic are considered to be rapid, depending on the material nature. Therefore, in order to reduce the negative impact of arsenic towards human health it is necessary to find some new materials for its removal.

For this reason, the project is focused on obtaining new materials for arsenic removal from drinking water, which have a good potential due to their low cost, eco-friendliness and low environmental impact.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

The main objective of the project is to investigate an original approach, regarding

- (i) the obtaining of new materials chemically modified through functionalization with crown ethers and loaded with iron ions,
- (ii) use of these materials as adsorbent in the view of arsenic removal from waters and
- (iii) the reprocessing of these materials through refunctionalization.

The research presents an absolute novelty and has an exploratory character by obtaining of some new functionalized materials for arsenic removal, and through their reprocessing, after exhaustion bringing fundamental elements in the building of young research team, able for competition in the frame of European programmes.

Results

The results dissemination of the research are take in:

- 2 articles in ISI indexed journals;
- 2 articles in ISI-Proceedings;
- 6 papers are communicated and published in the specialty conferences volumes (Water Pollution XIV, 22-24 May 2018, Coruna, Spain; Polymers and Organic Chemistry 2018 (POC 2018) 4-7 June, Montpellier, France, 30.09-3.10. 2018, Bor Lake, Serbia, 11-12.10.2018, Timișoara, Romania)

Applicability and transferability of the results:

- Project could have a potential impact on Waters Utilities, Institutes of Public Health and Veterinary Health Directorates in the West Area.
- This project assumes an interdisciplinary approach which will elucidate the mechanism of arsenic removal from water through adsorption on chemically modified materials through functionalization with crown ethers and loaded with iron ions.
- Improved university-industry relationships.

Research team

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MULTIPHASE CONVERTERS FOR SOLAR ENERGY CONVERSION AND BATTERY CHARGING IN ELECTRIC VEHICLES

Goal of the project

Proposal of two new dc-dc multiphase converter families suitable in solar energy processing and battery charging systems.

Short description of the project

The multiphase Boost family exhibits higher static conversion ratio while maintaining a smooth input current and high efficiency.

The Buck family consists of topologies prone to be used in battery charging because of smooth output current.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

Activity 1.1. Synthesis of a multiphase converter family based on the C-Step Down cell.

Activity 1.2. Converters design.

Activity 1.3. Model validation by simulation.

Activity 1.4. Equipment purchase.

Activity 1.5. Synthesis of a multiphase converter family based on the L-Step Up cell.

Activity 1.6. Converters design.

Activity 1.7. Model validation by simulation.

Activity 1.8. System architecture for solar energy conversion system using L-SU topology.

Activity 1.9. Component purchase.

Activity 1.10. Participation at the SACI 2018 Conference.

Activity 1.11. Practical implementation of converters. Hardware testing and practical measurements.

Activity 2.1. Payment of participation fee for EPE and PEMC conference.

Activity 2.2. System architecture for solar energy conversion system using L-SU topology. Practical measurements.

Activity 2.3. Defending the paper at the PEMC 2018 Conference.

Activity 2.4. Defending the paper at the EPE 2018 Conference.

Activity 2.5. Battery charging system based on C-SD converters topologies. Measurements and system evaluation.

Activity 2.6. Defending the paper at the ISETC 2018 Conference.

Activity 2. Paper sent to an ISI journal (letter accepted and published).

Results

The proposed topologies were validated by experiment and by being published at the following international conferences and journal.

1. I-M. Pop-Calimanu, S. Lica, S. Popescu, D. Lascu, I. Lie, R. Mirsu, „A New Hybrid Inductor-Based Boost DC-DC Converter Suitable for Applications in Photovoltaic Systems”, „Energies”, vol. 12, no.2.
2. I-M. Pop-Calimanu, S. Lica, F. Renken, R. Mirsu, G. Simion, I. Lie – „A Comparison Between Single-Phase and Two-Phase Hybrid Boost-L Converter”, International Symposium on Electronics and Telecommunications 2018, Timisoara, Romania.
3. I-M. Pop-Calimanu, S. Lica, D. Lascu, F. Renken – „A Novel Hybrid Buck-L Converter”, 20th European Conference on Power Electronics and Applications – EPE'18 ECCE Europe, Riga, Latvia.
4. I-M. Pop-Calimanu, S. Lica, D. Lascu, F. Renken, M. Gurbina, R. Mirsu – „A Novel Hybrid Step-Down DC-DC Converter”, 18th International Conference on Power Electronics and Motion Control – IEEE-PEMC 2018, Budapest, Hungary
5. M. Gurbina, I-M. Pop-Calimanu, D. Lascu, S. Lica, A. Ciresan – „Exact Stability Analysis of a Two-Phase Boost Converter”, 41st International Conference on Telecommunications and Signal Processing, Athens, Greece.
6. I-M. Pop-Calimanu, R. Mirsu – participation at the 12th International Symposium on Applied Computational Intelligence and Informatics (SACI 2018), Timisoara, Romania.
7. I-M. Pop-Calimanu – participation at the tutorial „Fast Charging Ready? Infrastructure, Topologies and Key Enabling Components, EPE'18 ECCE Europe, Riga, Latvia.

Applicability and transferability of the results:

Companies producing and implementing equipment for PV based systems can easily adopt the Boost family as also a MPPT algorithm is provided and a system is presented in order to prove its applicability. For low power chargers automotive companies can take benefit of the new multiphase Buck converter.

Research team

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LORA - INTELLIGENT INFRASTRUCTURE FOR COMMUNICATIONS AND DECISION SUPPORT IN POWER SYSTEMS

Goal of the project

The main goal of this project is to create an IoT research and didactic laboratory, based on the LoRa technology and the LoRaWAN communication protocol, in which IoT devices will be developed for electrical and power systems applications.

Short description of the project

Enhance existing techniques, develop new ones in term of IoT applications for electrical and power engineering fields.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

During this project, the research team was focused on the following activities:

- Artificial intelligence algorithms adaptation, more precisely the swarm algorithms, to the requirements of the power engineering field;
- Developing different type of monitoring devices, based on the LoRaWAN communication protocol;
- Developing web based platforms for processing and analyzing the data coming from the monitoring devices;
- Equipping a laboratory with LoRaWAN-compatible equipment for further research and their integration into the teaching process;
- Validation of research results, attending international conferences and publishing results in prestigious journals.

Results

Team achievements within this project:

- a device that transforms a regular electricity meter into a smart one - using LoRaWAN communication protocol;
- an environment monitoring device for photovoltaic parks - using LoRaWAN communication protocol;

Results - continuation

- web-based application for processing and analyzing the data coming from the monitoring devices;
- scientific papers accepted for publication:
 - 4 in conference proceedings indexed in Thomson Reuters Web of Science (WoS),
 - 4 papers published in conference proceedings indexed in international databases,
 - 1 paper in WoS journals with impact factors and
 - 1 book chapter in a Springer-Verlag volume.

Applicability and transferability of the results:

- Through developed devices, the authors have demonstrated that old meters need not necessarily be replaced but can easily transformed into smart ones.
- Also, with the help of environmental monitoring devices for photovoltaic parks, it is possible to make better forecasts of electricity generation.

Research team

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OPTIMIZING RISK REDUCTION STRATEGIES FOR GEOMORPHOLOGICAL HAZARDS BY 3D MODELING

Goal of the project

The project aims to optimize risk reduction strategies for geomorphological hazards by their 3D modeling in the context of Romania's susceptibility and poor management of local authorities who are insufficiently prepared to manage such situations.

Short description of the project

Landslides are complex phenomena regarding the effects they produce; thus representing a risk factor to be assessed and quantified. 3D modeling of geospatial data characteristic to landslides acquired using TLS technology and UAVs is useful for monitoring and determining the risk potential of certain areas.

Implementation period

June 2018–June 2019

Budget

46.500 RON (10000 EUR)

Main activities

Preliminary research was realized in order to choose a pilot study area. Then data collection on field involved using 2 different technologies, namely Terrestrial Laser Scanning and Unmanned Aerial Vehicle (drone). Further, the geospatial data acquired was processed using specialized software in order to obtain the 3D model of the landslide from the pilot study area. A comparative study of the 3D models realized is also of interest in order to determine particularities of the 2 technologies. The final part of the project includes optimizing risk reduction strategies for geomorphological hazards.

Results

The results are useful for managing the destructive effects of geomorphologic hazards on the environment and to optimize their forecasting and post-factum approaches.

Applicability and transferability of the results:

The geodetic engineer participates to the acquisition, manipulation, visualization and analysis of geospatial data characteristic of hazards in order to adopt the most appropriate methods of protecting and preserving the environment in order to adapt to climate change. Knowledge transfer and dissemination of project results is aimed at raising awareness organizations, both public and private, that are active in geodesy and civil engineering.

Research team

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REDUCING FUEL CONSUMPTION OF INTERNAL COMBUSTION ENGINE BY RECOVERING LOST ENERGY

Goal of the project

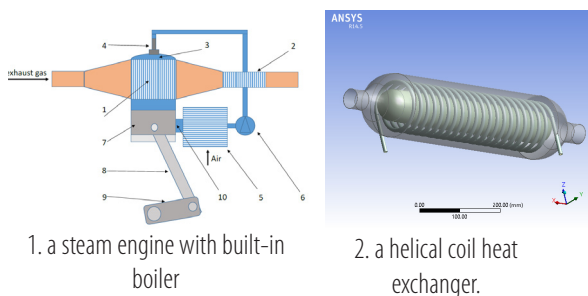
The problem of polluting emissions in the field of transport is becoming more and more stringent, so there is a general interest in finding solutions to reduce pollutant emissions and fuel consumption.

Short description of the project

The following major objectives were proposed:

1. Reduction of pollutant emissions produced by ICE;
2. Reducing fuel consumption by recovering dissipated energy;
3. Increasing global thermal efficiency;
4. Increase the level of knowledge.

For the ICE exhaust heat recovery two system were proposed:



1. a steam engine with built-in boiler

2. a helical coil heat exchanger.

For experimental trials of the proposed system, three internal combustion engine stands have been upgraded and put into operation.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

During this project, the research team was focused on the following activities:

- Development of a mathematical model and simulation of a built-in instantaneous steam boiler engine.
- Verification design of Dynamic Vapor Testing Cell for verifying the developed mathematical model.
- Modernization of three internal combustion engine stands to be used for the study of energy recovery.
- Elaboration of the helical spiral boiler model for FEM analysis.
- Preliminary trials were carried out with the three internal combustion engine stands.

Results

As a result of the activities carried out, a paper was submitted to an ISI journal and 4 papers were presented within international conferences and the papers are classified as ISI proceedings.

- 1. Vaporization of thin film in case of vapor bubbles. New resolution approach, Virgil Stoica, Mariana Ilie.
- 2. Flash boiling steam engine, Virgil Stoica, Gavrilă Trif-Tordai, Mariana Ilie, Delia Calinoiu,
- 3. Experimental bench test for boiling dynamics, Virgil Stoica, Mariana Ilie, Andrei Borborean, Cioabla Adrian, Dorin Lelea,
- 4. Test Bench for the Effects of Water Injection in an Internal Combustion Engine, Andrei Tiberiu Borborean, Virgil Stoica, Dorin Lelea,
- 5. Application of Biogas Inside and Motogenerator – Case Study, Adrian Eugen Cioabla, Virgil Stoica, Francisc Popescu.

Applicability and transferability of the results:

The results obtained to date show that the simple injection of water in the case of internal combustion engines involves a 30% reduction of nitrogen oxides emissions. This solution can be applied with low-costs on series internal combustion engines.

The project being focused on practical solutions applicable in everyday life, we expect that the on-coming results due to project implementation, to be practically applicable in industry.

Research team

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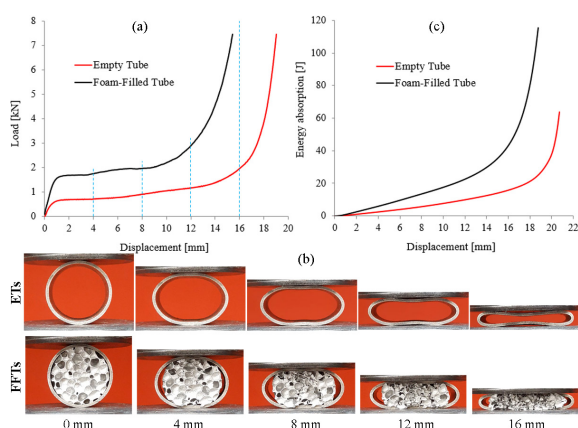
MECHANICAL CHARACTERIZATION OF ADVANCED COMPOSITE STRUCTURES WITH ALUMINUM FOAM CORE

Goal of the project

The main objective of this project was the development and mechanical characterization of advanced composite structures with aluminum foam core (TUSAA), both for the purpose of professional development of the young researchers involved in this project, as well in order to increase the scientific visibility of the Politehnica University Timișoara.

Short description of the project

This project focuses on the compressive performances of thin-walled steel tubes filled with closed-cell aluminum-alloy foam. For this purpose, the compressive behavior of empty and ex-situ foam-filled tubes were experimentally and numerically evaluated under different loading conditions (quasi-static / impact loading, uniaxial / lateral loading - see the figure below, room / high temperatures).



Load-displacement/energy-displacement curves (a,c) and deformation sequences (b) of empty and foam filled tube.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

1. Design and manufacture of TUSAA composites;
2. Mechanical characterization of TUSAA composites;
3. Micro-structural analysis to highlight TUSAA degradation;
4. Numerical analysis of TUSAA composites.

Results

1. Publication of 9 scientific papers in the ISI circuit, of which 8 as the first author, as follows:

- 5 papers in ISI journals with impact factor:
 - Composite Structures (Q1, IF=4,101);
 - Journal of Alloys and Compounds (Q1, IF=3,779);
 - Engineering Fracture Mechanics (Q1, IF=2,580);
 - Polymers (Q1, IF=2,935);
 - Materials (Q2, IF=2,467).
 - 4 papers in ISI Proceedings (IOP Conference Series: Materials Science and Engineering volume).
2. Participation at 2 international conferences of the project manager and two members of the research team:
- The 7th Int. Conf. on Adv. Materials and Structures, Timisoara (Romania), <http://ams.upt.ro/>;
 - The 21st Int. Conference on Composite Structures, Bologna (Italy), <https://events.unibo.it/iccs21>.

Applicability and transferability of the results:

Metallic Foams (MFs) have grown considerably over the past 20 years, both from a technological point of view and through the achievement of high mechanical properties. Thus, the use of MFs has experienced a major spread from the automotive industry (filling stiffening elements with MFs in order to increase energy absorption capacity), to civil engineering (panels and heaters made of MFs).

Research team

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OBTAINING AND CHARACTERIZING OF BULK AMORPHOUS STEELS

Goal of the project

This project was aimed processing and characterization of bulk amorphous steels from the Fe-Cr- (Mo, Mn) - (Y, Ga) -C- (B, Si, P) family by casting in copper mold and using ferro-alloys as raw materials.

Short description of the project

Two families of alloys were studied: Fe-Cr-Mo-Nb-C-Si-Ga and Fe-Cr-Mo-Nb-C-Si-Y.

There were obtained alloys in the form of $\varnothing 3 \times 50$ mm bars and in the form of discs of $\varnothing \square 10 \times 1$ mm by pressure casting in cooper mold method (fig.1).



Fig. 1 Obtained alloys

The structural analysis showed that both alloys with Ga and Y have the amorphous structure at concentrations of at least 4% at. Ga and Y respectively.

The obtained alloys have good thermal stability (crystallization temperature, T_x , is over 630oC), but Ga alloy has a better glass forming ability (GFA).

The alloy with Ga has mechanical strengths, R_m , and corrosion resistance, expressed by the corrosion rate, v_{cor} , superior to alloy with Y but is fragile. Y-alloys instead have a ductile behavior, having plastic deformation before breaking.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

- The establishment of the optimal composition of the master alloy;
- Elaboration and characterization of the master alloy;
- Optimizing chemical composition based on structural analysis;
- Constructional-technological design of copper molds for alloy casting;
- -Establishing the casting technology of the alloy developed in the form of cylindrical bars or discs;
- Structural characterization of obtained alloys;
- Determination of mechanical properties;
- Determination of corrosion resistance.

Results

1. Project team members participated in two international conferences:

- 7th International Conference on Advanced Materials and Structures, AMS 2018, March 28-31, 2018, Timișoara, with the paper "Simulation of Thermal Field in Bulk Amorphous Steels" - ISI Quoted Conference;
- The 25th International Symposium on Metastable, Amorphous and Nanostructured Materials (ISMANAM 2018), 2-6 July 2018, Rome, Italy, with the paper "Synthesis and characterization of bulk amorphous steel using industrial ferro-alloys" - selected papers will be published in ISI quoted journals

2. An article "Influence of Co substitution for Cr on glass forming ability and mechanical properties in Fe-based bulk metallic glass" was sent to HELIYON - Elsevier magazine, accepted for publication with revised manuscript.

Applicability and transferability of the results:

Bulk amorphous steel (BAS), has drawn great attention for structural and functional applications due to the unique properties such as high fracture strength, high hardness, excellent corrosion resistance. In addition, the Fe-based BAS can be fabricated by using industrial ferrous-alloys, significantly reducing the production cost. Consequently, Fe-based BAS can be an excellent choice for medical implants, surgical tools and other biomedical related parts. They can also be used in fabrication of microgear for micromotors.

Research team

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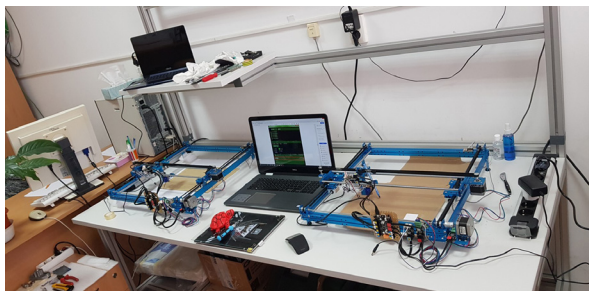
INNOVATIVE MECHATRONIC DEVICES FOR RECONFIGURATION AND REUSE OF PACKAGING

Goal of the project

The basic idea of the project is to create and develop a mechatronic device to reconfigure a packaging of conventional materials which, until its recycling can be reused for another purpose.

Short description of the project

The packaging reconfiguration device is supposed to be a small flexible manufacturing cell composed of an adaptable “two-coordinate pen plotter”, to which we can also associate a knife with which, after tracing the ways for reconfiguration, we can cut the areas in which the packaging will fold.



Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

- Identifying the components needed to achieve the device, determining the best acquisition costs.
- Modular design of the devices provided in the project.
- Studying the variants developed for the purpose of choosing a first prototype variant of the device.
- Testing the obtained devices, determining the optimal working parameters.
- Identify, test and establish CAD/CAM/CAE modeling software that best fit in the packaging modeling phase for reconfiguration and reuse.
- Possibility to carry out practical activities with the devices designed and the possibility to develop related laboratory applications.

Results

- Determining the optimal technical solution to meet the required requirements.
- Drawing up a list of the main components of the stand/device to reconfigure the packaging.
- Choosing the most advantageous offer.
- Determining a first virtual version of the work device, testing the device and choosing the type of packaging involved.
- Depending on the virtually developed solutions, choosing the best option.
- Testing the device with which we reconfigure the packaging, calibrating it to the optimal working parameters for the different packaging ranges under reconfiguration.
- Attempts to see the device's behavior at work, determine possible errors in operation, and determine how to correct them.
- Conceiving, structuring and drafting the technical documentation containing the working methodology of the devices proposed in the project.

Applicability and transferability of the results:

Designing laboratory work related to disciplines in the Department of Mechatronics and Robotics. Preparation of laboratory work. Making a teaching material with the right steps in using and working with this device.

Developing and other applications that are suited to working with our stand equipment.

Research team

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THE STUDY OF HAMILTON-POISSON SYSTEMS AND THEIR INTEGRABLE DEFORMATIONS USING THE ENERGY-CASIMIR MAPPING

Goal of the project

1. The study of the Hamilton-Poisson systems by using the associated energy-Casimir mapping.
2. The study of changes in the behavior of dynamical systems by using some integrable deformations.

Short description of the project

We study the connections between the dynamics of Hamilton-Poisson systems and the corresponding energy-Casimir mapping.

We also consider integrable deformations of known dynamical systems.

Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

- The study of some integrable deformations of relevant dynamical systems
- The study of the energy-Casimir mapping with polynomial and non-polynomial components
- The study of some general results of the integrable deformations of the three-dimensional Hamilton-Poisson systems
- The study of the connections between the partition of the image of the energy-Casimir mapping and types of orbits

Results

- 2 papers published in ISI journals
1. "Integrable Deformations of Three-Dimensional Chaotic Systems", Lăzureanu, C., INTERNATIONAL JOURNAL OF BIFURCATION AND CHAOS, Volume: 28, Issue: 5, (2018)
 2. "Stability and Energy-Casimir Mapping for Integrable Deformations of the Kermack-McKendrick System", Lăzureanu, C., Petrișor, C., ADVANCES IN MATHEMATICAL PHYSICS, Volume 2018, (2018).

Results

- 3 communications / submitted papers (ISI Conferences)
 1. "Stability and some special orbits for an integrable deformation of the Rikitake system", Lăzureanu, C., Hedrea, C., Petrișor, C., International Conference ICAMCS 2018, Paris, France.
 2. "On the integrable deformations of a system related to the motion of two vortices in an ideal incompressible fluid", Lăzureanu, C., Hedrea, C., Petrișor, C., International Conference ICCMAE 2018, Timișoara.
 3. "Chaotic Behavior of an Integrable Deformation of a Nonlinear Monetary System", autor: Lăzureanu, C., International Conference ICNAAM 2018, Rodos, Greece.
- 2 communications / submitted papers (BDI Conferences)
 1. "On a deformed version of the T system", autori: Lăzureanu, C., Căplescu, C., International Conference ICMA 2018, Timișoara.
 2. "On the dynamics of a Hamilton-Poisson system", Lăzureanu, C., Petrișor, C., International Conference ICMA 2018, Timișoara.

Research team

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RESEARCH AND EDUCATIONAL LABORATORY „LEAN AND SUSTAINABILITY”

Goal of the project

Initiating an interdisciplinary educational and research laboratory called “Lean and Sustainability” by using and developing enterprise games that physically simulate an enterprise’s activities, focusing on lean and sustainability concepts.

Short description of the project

Project target groups: students, teachers/researchers, companies, which may use improvement tools.



Enterprise games were purchased and a new game was created for educational and research purpose.



Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

- Dissemination and launching of the project workshops.
- Scientific research under the theme “Lean and Sustainability”.
- Creating the Lean and Sustainability Educational and Research Lab.
- Acquisition of enterprise games.
- Training the trainers for business games.
- Use of enterprise games in the laboratory for students.
- Creating a new game / tool that combines the advantages of the two concepts.
- Participating with scientific articles at prestigious international conferences.
- Publication of scientific articles in indexed WOS journals.
- Making materials for dissemination (flyers, posters, roll-ups, banner and web page).

Results

- “Lean and Sustainability” Educational and Research Laboratory – M104 room, FMPT
- 2 dissemination workshops - project launch (Dec 2017) + project completion (Dec 2019)
- 2 purchased enterprise games in the theme of the proposed new lab
- New SLIM Game and SLIMx tool created
- 8 Instructors trained in the newly created business game
- Enterprise games played in the lab with students
- Materials made for dissemination (flyers, posters, roll-ups, banner, folders, notebooks, pens, web page)
- 6 project members’ participations in conferences (3 conferences, 2x project manager, 4x team members, 1 virtual presentation).
- 3 scientific papers published at conferences.
- 2 scientific articles in WOS journals (1 published, 1 in evaluation).

Applicability and transferability of the results:

The project applicability are: in laboratory for training students to use lean and sustainability tools; in research in the interdisciplinary domain of the two concepts; in companies to use improvement tools. Teaching using enterprise games was a goal, physically simulating enterprise’s activities, with transferability of learning in laboratory as student to using at actual work place as employee.

Research team

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A MULTILINGUAL EXPLANATORY DICTIONARY OF EDUCATIONAL TERMS (ROMANIAN, ENGLISH, GERMAN, FRENCH)

Goal of the project

The main goal was to create a multilingual explanatory dictionary of educational terms which updated the list of educational terms, explained them in Romanian and equated them in English, German and French.

Short description of the project

The main goal was to create a multilingual explanatory dictionary of educational terms which updated the list of educational terms, explained them in Romanian and equated them in English, German and French.



Implementation period

21.11.2017 – 31.12.2018

Budget

46.500 RON (10000 EUR)

Main activities

- Identification of specialised texts available both in print and in electronic forms;
- Building a terminological corpus;
- Source-term extraction;
- Equating the Romanian terms in the other three languages;
- Accessing terminological databases to expand the terminological corpus;
- Alphabetic indexing of the Romanian terms;
- Definition and explanation of terms in Romanian;
- Checking dictionary content;
- Preparing the electronic version of the manuscript;
- Scientific reviewers' manuscript review;
- Publication of the dictionary.

Results

- 2 scientific papers presented at 2 ISI conferences, in which the entire team participated, and published in the conference proceedings:
 - Proceedings of EDULEARN18 Conference
 - ICERI2018 Proceedings
- Submitting a study for publication in the ISI journal International Journal of Lexicography (authors: the entire team)
- Participation in an international prestigious conference, British and American Studies (BAS) 2018, of the project manager and a member of the research team, where a study made by the entire team was presented
- Publication of the dictionary
- Participation of the entire team, with 4 scientific papers, in the international conference Professional Communication and Translation Studies PCTS 11 (4-5 April 2019)
- Participation, with 2 scientific papers, of the project manager and a member of the research team in the international conference British and American Studies (BAS) 2019 (18-19 May 2019).

Applicability and transferability of the results:

The dictionary enriches the terminological studies by updating the list of Romanian educational terms, by explaining them in Romanian, and by equating them in three other languages. In the context of the internationalization of education, the dictionary is a useful tool for anyone working in the educational field.

Research team

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