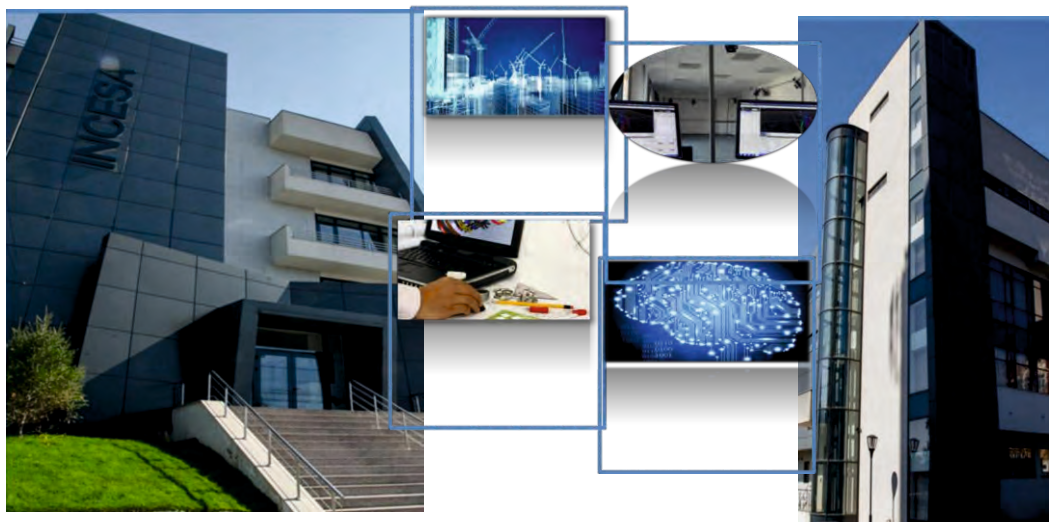


***DRIVING EFFECTIVE
INNOVATION***



INCESA FOR THE FUTURE



**INCESA
Research Hub of Applied Sciences
107 Decebal Bld.**

MISSION STATEMENT

Our areas of research are geared directly to the needs of the society: energy, mobility, communication, environment, health.

Commitment 1

To inspire the co-working space to drive effective innovation for the benefit of ever wider communities.

Commitment 2

To harmoniously meet the expectations of cutting-edge researchers, entrepreneurs and strategic business and socio-cultural partners in a most active and interactive way.

Commitment 3

To frame mindsets, incubate innovative ideas.

Commitment 4

To intensify and amplify outcomes for all the intended partners and users.
Manageably. Outreaching. Feedforwarding.



Prof. Eng. Leonardo Geo Mănescu, PhD
General Manager

E-mail: leonardo.manescu@incesa.ro

CORE STRATEGIES

WHEN THERE IS TOMORROW: INCESA Projects

OUR VISION, THEIR FUTURE: INCESA grants for students

LIFELONG LEARNING THROUGH RDI

RESEARCH CENTRE FOR ELECTRICAL ENGINEERING

Laboratory of Innovative Techniques and Processes in Complex Electromechanical Systems

Laboratory of Innovative Techniques and Processes in Mechatronics and Robotics

Laboratory of Innovative Techniques and Processes in Smart Grids

RESEARCH CENTRE FOR MECHANICAL ENGINEERING AND MATERIALS SCIENCE

Laboratory of Physical - Chemical Characterisation and Materials Testing

Laboratory of Microtechnologies

Laboratory of Mechanical Engineering

RESEARCH CENTRE FOR BIOTECHNOLOGY AND BIOENGINEERING

Laboratory of Innovative Techniques and Processes in Bioengineering

Laboratory of Modelling, Identification and Control of Biochemical and Biotechnological Processes

Laboratory of Innovative Techniques and Processes in Biotechnology

Laboratory of Biomechanics

RESEARCH CENTRE FOR COMPUTER SCIENCE

Laboratory of Formal Intelligence Integration in Analysis, Simulation,

Development, Testing and Certification of Communication Infrastructures

Laboratory of Computer Engineering

Laboratory of Advanced Research in Applied Mathematics

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CORE STRATEGIES

INCESA is designed to be a community able to provide a set of productivity tools and connect with global technology professionals.

The INCESA hub is focused on:

- identifying original solutions with applicative potential by new or existing SMEs, as well as the Chambers of Commerce and Industry and IRC 4D (Innovation Relay Centres);
- boosting the research motivation of companies through using consultancy and direct access to our infrastructure for their own R&D activities and resources, and convergent projects in a partnership underlying innovative approaches.

INCESA is currently one of the largest Romanian organisations of applied research. It was designed to support the regional evolution of R&D infrastructure and activities according to the institutional strategy of the University of Craiova that will enhance:

- integration to the European research networks;
- compatibility with the EU research infrastructure;
- multidisciplinary research capacity.



As a pyramid research organization, it is able to:

- connect the doctoral schools with the initial and lifelong learning, training and professional development in our university;
- bring together international scientists for joint research activities;
- train the researchers from the business environment.



Our strength lies in our inter- and multidisciplinary approach.

Our team of engineers, computer scientists and numerous other scientists cater fully-rounded solutions, from concept to implementation, assisted by dedicated software.

We design and optimise products, improve processes, shape technology according to the current and future industry interests and needs.



WHEN THERE IS TOMORROW: INCESA Projects

Smart solutions for neutral grounding in 110 kV / MT electrical substations for increasing of the energy efficiency, personnel security and reliability of the consumers' supply, PN-III-P2-2.1-BG-2016-0202 PN - III BRIDGE GRANT 2016

Partner: Distribuție Oltenia SA

Intelligent system for monitoring and management of power quality at the interface between the electricity distribution network and its users, PN-III-P2-2.1-BG-2016- 0269 PN-III BRIDGE GRANT 2016

Partner: Distribuție Oltenia SA

Ford Romania – University of Craiova Partnership for the transfer, implementation and adjusting of the FORD eco-technologies to the development of the EcoSport model in Craiova, PN-III-P2-2.1-BG-2016- 0123 PN-III BRIDGE GRANT 2016

Partner: Ford Romania SA

Technical state evaluation of the electrical distribution networks of SC CEZ Distribuție SA – contract-based research 2016

Beneficiary: Distribuție Oltenia SA

Intelligent traction system, energy efficient for new generations of light rail machines – Programme POC-A1-A1.2.3-G-2015 - Partnerships Sect. G

Study regarding the impact of reactive power on losses and power quality in 110 kV distribution grids – industry contract-based research 2015

Beneficiary: Distribuție Oltenia SA

Study regarding the impact of the connection of single- and three-phase electricity producers to low-voltage networks- contract-based research 2017

Beneficiary: Distribuție Oltenia SA

Anodic advanced materials for improving performance and durability – Programme PN-III-P2-2.1-PED-2016- 0676

Director: Assoc. Prof. Nicoleta Cioateră, PhD

Project value: 600,000 lei

Partner: "IlieMurgulescu" Physical Chemistry Institute

The active and passive recovering of the upper limb, PN-III-P2-2.1-BG-2016- 0139 PN-III BRIDGE GRANT 2016

Partner: MPD AURORAIMPEX SRL

Partnerships for knowledge transfer, technological and applied research for innovative solutions of intelligent systems designated for the energy efficiency increase– Programme POC-A1-A1.2.3-G-2015 - Partnerships Sect. G

Researches and knowledge transfer in the field of the technologies and of the software tools for informatisation of the industrial processes - Programme POC-A1-A1.2.3-G-2015 - Partnerships Sect. G

Intelligent solutions for increase of security and competitiveness by monitoring, diagnosis, reducing the effects of unwanted energy and increasing energy efficiency of generation and industrial consumers – Programme POC-A1-A1.2.3-G-2015 - Partnerships Sect. G
Potential beneficiaries: SC SOFTRONIC SRL, INAS SA, SC Elecmond Electric SRL



OUR VISION, THEIR FUTURE: INCESA grants for students



Green energy for Main Building

Predictive maintenance

Reverse engineering design of permanent magnet electric vehicles of a GENSET machine: 3D scan

Market analysis (marketing)

RES impact: feed-in tariff

Electric kart applications

Smart Tracking System of Vehicles

Partnerships of knowledge transfer, technology and applied research for innovative solutions of smart grids to increase power efficiency

Automotive electric and electronic equipment.

Electric power supply systems

Automotive electric and electronic equipment.

Electronic stability control

Research and knowledge transfer in technology and software tools for industrial processes digitalization

Connecting the biometric access control system to central configuration and monitoring node

Software design + Human Resources database of research projects

Set-up/configuration of video/audio conference system

Faculty assets database

Smart Warehouse Vehicle

Smart Tracking System of Vehicles

Research on the use of aerial survey for GIS database design at the University of Craiova

In vitro reproduction of horticultural species for ornamental and food industry purposes
N-3 polyunsaturated and carotenoid fatty acid enriched hen egg - food resulting from the use of unconventional foragematerials for egg-laying hens

Complex analysis of neuromuscular parameters in patients with neuromotor impairment, clinical and therapeutic applications in rehabilitation

INCESA telephone cabling and exchange configuration

IT economic tools: design + management (estimates, reports)

INCESA intranet design

Procurement IT tool design

Case study: Recruitment policy at the University of Craiova

Marketing + counselling of the University of Craiova prospective students

Stage performance subtitling: audio-visual translation of mainstream texts

Virtual tour of the University of Craiova

Geomorphology use in urban planning





LIFELONG LEARNING THROUGH RDI

Programmes addressing the business environment

Excel training - advanced users, 2016, 2017
Beneficiary: Ford Romania SA

Excel training - beginners, 2016, 2017
Beneficiary: Ford Romania SA

Language training and development - English, German and Romanian, 2016, 2017
Beneficiary: Ford Romania SA

"TRAINER" training - COR Code 242401, accredited by National Qualifications Authority 2016, 2017
Beneficiary: Ford Romania SA

"Romanian Energy Regulatory Authority (Romanian acronym - ANRE) Manager" training - 2016
Beneficiary: Energy companies

CATIA training - beginners, 2017
Beneficiary: Ford Romania SA

"Health and workplace safety specialist" training- COR Code 226302, accredited by National Qualifications Authority 2017
Beneficiary: Ford Romania SA

Language training and development - Romanian, 2017
Beneficiary: Electroputere SA



Programmes addressing Bachelor's / Master's / Doctoral students



INCESAgrantees training - 2016
Beneficiary: University of Craiova
Bachelor's / Master's / Doctoral students

FORD grantees training - 2016
Beneficiary: University of Craiova
Bachelor's / Master's / Doctoral students

Pirellgrantees training - 2017
Beneficiary: University of Craiova
Bachelor's / Master's / Doctoral students

ProELITE - 2017
Beneficiary: University of Craiova
Bachelor's / Master's / Doctoral students



RESEARCH CENTRE FOR ELECTRICAL ENGINEERING



Laboratory of Innovative Techniques and
Processes in Complex Electromechanical Systems



Laboratory of Innovative Techniques and
Processes in Mechatronics and Robotics



Laboratory of Innovative Techniques and
Processes in SMART GRIDS

Head:

Prof. Eng. Lucian Mandache, PhD

E-mail: lmandache@elth.ucv.ro

“As a part of INCESA, our centre (CEE) integrates theory and practice to incubate a culture of innovation and entrepreneurship in the electrical field, aiming to develop the critical thinkers and leaders of tomorrow. CEE is committed to finding solutions to the challenges of clean energy and climate change through education and research.”

Laboratory of Innovative Techniques and Processes in Complex Electromechanical Systems

Development of scientific research in the field of complex electromechanical systems and associated control systems.

Research topics

- Active Power Filter
- High energetic performance static converters
- Regenerative systems
- Induction heating systems
- Electrical traction motors
- Neuro-fuzzy control algorithms
- Optimised orientation of solar pannels
- Digital motion control by DSP, MCU, FPGA
- Renewable energy sources
- Clean energy
- CAD programs
- Very high level programming language

Research objectives

- development of theoretical and experimental research in the field of complex electromechanical systems
- technology transfer to industry through partnership research and projects
- increasing access to financial resources for research through participation in national and European projects
- creating the appropriate framework for the development and exploitation of research potential of Master's and doctoral students
- increasing the national and international visibility of the Faculty of Electrical Engineering, University of Craiova

Services

Industrial research and experimental development in the field of complex electromechanical systems: active power filters; high energetic performance static converters for dedicated applications (induction heating systems, regenerative systems); electrical traction motors; high performance control algorithms; efficient storage technologies for intermittent generation units; integration and management of the clean energy sources for improving the quality and operation stability.

Head: Prof. Eng. Mihaela Popescu, PhD
E-mail: mpopescu@em.ucv.ro

Research Facilities and Tools



Integrated DSP system for control, monitoring and diagnosis in power electronics applied in active filtering and performant electric drives:

- Portable Industrial Computer
- Programmable three-phase nonsinusoidal voltage source
- Three phase PWM Rectifier.

System for the analysis and diagnosis of resonant and PWM converters:

- High performance industrial computer; Tektronix MSO4104B-L scope
- DSP R&D DS 1104
- Three phase resonant inverter.

Equipment for the determination of the loss factor, relative permittivity and resistivity of insulating liquids.

System for the study of distributed generation systems:

- Wind turbine with integrated brake unit
- Equipment for evaluation of the renewable energies potential (meteo data-logger for air temperature/humidity, wind speed/direction, piranometer)
- Industrial computer.

System for the study of electrical equipment for ecological vehicles:

- Diagnosing the defects of electrical machines
- Study of electronic stability control ABS+ASR+EBD+ESP
- Stand for study of electrical equipment of a car motor;
- Computerized fuel cell.

Integrated system for the validation of industrial process control algorithms:

- Complete platforms for motion control for brushless motors and induction motors
- Integrated Development Environment with very high level programming language
- Real-time development system programmable under Matlab
- FPGA development system.

Hybrid system for electric power supply based on renewable:

- Polycrystalline Photovoltaic panel
- Remote monitoring system.

Laboratory of Innovative Techniques and Processes in Mechatronics and Robotics

Cutting-edge research in Mechatronics and Robotics, and solutions for current and potential future needs of regional and international industries.

Research topics

- ⊗ Complex and unconventional algorithms and control systems for MRSS (fuzzy, neuronal, adaptive, robust, control in fault conditions, etc.)
- ⊗ Flexible manufacturing processes
- ⊗ Applications of the MRSS for specific domains (assembly tasks, medical services, person assistance, rehabilitation etc.)
- ⊗ Wheeled mobile robots navigation, path planning and control systems, collision avoidance
- ⊗ Biped and multi-legged locomotion
- ⊗ MRSS in automotive industry
- ⊗ Telecontrol systems of the MRSS, telepresence and teleoperation
- ⊗ Control systems of the robots in cooperative and coordinative tasks
- ⊗ Using smart materials (ER, MR, SMA etc.) to MRSS
- ⊗ Unconventional MRSS (hyper-redundant structures, modular and reconfigurable structures, biorobotics, under actuated structures, MEMS, etc.)
- ⊗ Haptic and human-machine interfaces
- ⊗ Smart houses
- ⊗ Pattern recognition, robot vision, visual servoing
- ⊗ Wearable robotics
- ⊗ Virtual reality

Research objectives

- ⊗ Mechatronic or Robotic Structures and Systems(MRSS) design
- ⊗ MRSS kinematic and dynamic modelling and simulation
- ⊗ MRSS control
- ⊗ MRSS integration in complex manufacturing systems, applications design

Services

The laboratory mainly undertakes basic and generic research in these areas in collaboration with the industry, other research centres and laboratories, and universities. Our objective is to deterministically produce higher performance at lower costs.

Head: Prof. Eng. Dorin Popescu, PhD
E-mail: dorinp@robotics.ucv.ro

Research Facilities and Tools

Digital printer for printing directly on objects with dedicated software.

Full-HD 3D display Alioscopy 42" – for real-time computer graphics, professional imaging, design and prototyping.

HMI and programmable logic controllers – for control algorithms and systems implementation.

Robot Kuka KR 6 R900 sixxAgilus with gripper and compliance system – for robotic applications design.

SCADA software and testing system – for the development and testing of SCADA applications.

Lathe; the machine is controlled by a PC (with dedicated software) in conjunction with a control keyboard - for the achievement of designed components.

Laser engraving and cutting machine with dedicated software - for achievement of designed components.

Computer-controlled milling machine with 3 axes and dedicated software – for achievement of designed components.

Linear axes with control system – for mechatronic system design and implementation.

"All in one" HMI and PLC; - for control algorithms and systems implementation.

3D design software – design, simulation, animation for a large domain of applications in mechatronics and robotics.

Head Mounted Display - Oculus Rift Developer – for virtual application testing and design.

Dual Channel Function/Arbitrary Waveform Generator.

CyberGlove Data Glove, Polhemus Fastrak, CyberGlove SDK.

System for high speed image acquisition with dedicated software – for image acquisition and pattern recognition.



Laboratory of Innovative Techniques and Processes in SMART GRIDS

Research key issues related to energy transmission and integration of renewable energy systems to the current grid and future smart grids.

Our goal: cleaner, more resilient and less expensive power system operation.

Research topics

- ⚙️ Grid Side Management
- ⚙️ Generation and Distributed Energy Resources (DER)
- ⚙️ Integration of distributed generation
- ⚙️ Real time monitoring of the grid
- ⚙️ Virtual power plants
- ⚙️ Smart Home/Buildings
- ⚙️ Driving of the active electrical consumers
- ⚙️ Demand response
- ⚙️ Advance Metering (AM)
- ⚙️ Energy efficiency
- ⚙️ Voltage control and reactive power
- ⚙️ EMC (electromagnetic compatibility) tests
- ⚙️ PQ (Power Quality) tests and analysis
- ⚙️ Microgrids
- ⚙️ Diagnosis tools
- ⚙️ Big data analysis for grid management
- ⚙️ Electricity Market
- ⚙️ Analysis of technology market in the Smart Grids
- ⚙️ Regulation schemes
- ⚙️ Trading schemes
- ⚙️ Impact of RES integration

Services

Contract-based classic research and specialised consultancy;
Research assistance for beneficiaries intending to use the INCESA's logistics and know-how;
Research hosting within the laboratory carried out by employees of the beneficiaries within the Master's or doctoral programmes;
Start-up research for companies by applying the solutions, techniques and methods developed within the laboratory;
Research in partnership within national or EU research programmes with similar entities in Europe, in areas of power systems & Smart Grids.

Research objectives

The SMART GRIDS laboratory complements the simulation studies with testing and analysis of components of power systems. The laboratory activity is supported by the most valuable specialised software library at the national level, as well as by high-performance test equipment. This will make the power system research and education bring benefits to both the university and industry.

Head: Assoc. Prof. Denisa Rusinaru, PhD
E-mail: denisa.rusinaru@incesa.ro

Research Facilities and Tools



Software library for design, simulation and analysis of power systems – commercial and academic licenses

- ETAP 14.1.0
- PowerWorld Simulator 18
- Paladin DesignBase 5.0
- PSCAD x4
- EMT-PV 3.3
- NEPLAN 5.5.3
- ELCAD/Engineering Base
- SmartFlow EUROSTAG 5.1
- Matlab R2015 & Simulink
- LabVIEW 20154
- PQViewPRO

Facilities and tools for testing and analysis of RES operation

- Experimental system for analysis of solar conversion phenomena: PV system 3.45 kW & energy storage units 12V-250 Ah&thermo solar installation 43 kW
- National norms agreed system for renewable energy units performance evaluation: remote acquisition system, power analyzers, specialized software PqVIEW PRO

Tools for assessment of energy system operation and efficiency

- Professional 2-points RayCam infrared thermal vision camera CA1888
- Intelligent Fault and cables locator system vLOCPro2
- 3-phase x 3-points power analyzer system MAVOWATT 30
- 3-phase power analyzer system MAVOWATT 240
- Secondary circuits analyzer MI2892

Tools for prosumers evaluation

- ALLENERGY 7 energy efficient building software design
- Professional software for buildings' energetic evaluation EnergyPro&EnergyAudit
- Fluids experimental plant with data acquisition GUNT variable speed pump 370 W
- WS-GP1 Compact Weather Station

EMC and Power Quality Testing

- GTEM 750 Cell
- Compact system for immunity testing, ITS 6006 Model
- Specialized software for immunity, emission and radiation test WIN6000, EMC32, GTEM3



RESEARCH CENTRE FOR MECHANICAL ENGINEERING AND MATERIALS SCIENCE



Laboratory of Physical-Chemical Characterisation
and Materials Testing



Laboratory of Microtechnologies



Laboratory of Mechanical Engineering

Head:
Prof. Nicolae DUMITRU, PhD
E-mail: nicolae_dtru@yahoo.com

“The Research Centre for Mechanical Engineering and Material Science (RCMMS) is a modern one, with high-tech equipment that support interdisciplinary and multidisciplinary research topics of applied mechanical engineering and advanced material science. The RCMMS mission enables INCESA Research Hub to take up research challenges of a broader scope and complexity than those addressed by a single investigator and to address issues that require the advantages of a larger infrastructure and interdisciplinary expertise provided by the INCESA community.”

High-quality research activities for a great variety of users based on our experience in synthesis, processing and characterisation of advanced materials.

Research topics

Processing of advanced materials as thin film and nanostructures films
Complex complementary investigation of thin film and multistructure
Structural and morphological investigation of materials by HR-XRD, confocal Raman spectroscopy, SEM

Investigation of thermal behaviour by dilatometry and thermal treatment under oxidative, inert and reducing atmosphere
Electrochemical investigation of solid oxides

Services: recent developments in the field of nanomaterials synthesis, functionalisation and processing fostered the dynamic development of optical, electrical and mechanical devices. In this context, the understanding of the complex relationship composition-structure-properties will enable the design of devices with the intended performances.

Research objectives

pulsed laser deposition thin films, nanostructured films for gas and bio-sensing;
pulsed laser deposition of thin oxide films on various substrates investigation of chemical composition and kinetics of facial layer growth during deposition;
innovative ceramic materials for fuel cells; hybrid materials for waste water treatment;
pulsed laser deposition (PLD), reactive PLD of nanostructured films for new applications in nanoelectronics, chemistry, and metallurgy;
complex complementary investigations of thin films and multi-structures.

Head: Senior Lecturer Nicoleta Cioateră, PhD
E-mail: cioatera.nicoleta@ucv.ro
Assoc. Prof. Mariana Osiac, PhD
E-mail: m_osiac@yahoo.com

Pulsed Laser Deposition System

The research focuses on the laser processing functional materials based on thin film and nanostructures by means of PLD pulsed deposition (PLD).

Research Facilities and Tools



X-Ray Diffraction System SmartLab RIGAKU

The high resolution XRD system equipped with an Anton Paar HTK 2000N high temperature chamber is featured by a great variety of optical components. This system allows for phase identification and texture analysis. ICDD PDF4/Organics and ICSD databases are available to confirm the phase identification.

inVia confocal Raman microscope Renishaw

The high resolution Raman microscope equipped with two laser lines (532 nm and 785 nm, respectively) and a Leica DM2500 microscope allows line scans, area mapping and volume scans.

Horizontal Dilatometer/DTA L75 PT Linseis

It allows for the evaluation of thermal behaviour for a wide variety of samples. Measurements can be performed under vacuum, as well as under oxidizing and reducing atmospheres. The following physical properties can be determined: CTE, sintering temperature, softening point, decomposition temperature, glass transition temperature.

Ultra-high Resolution Scanning Electron Microscope Hitachi SU8010

Hitachi SU8010 cFE-SEM is used for high resolution Imaging (SE resolution 1.3 nm at landing voltage 1.0 V) with magnification up to 800 000X. The microscope is equipped with an Oxford EDXS unit capable to determine elements down to Be.

R&D services in medical engineering, from complex software application development to instruments concept design and prototype manufacturing.

Research topics

- Medical hybrid imaging and navigation applications development
- Medical equipment and instrumentation design and prototype manufacturing
- Computational analysis of anatomical structures under normal and pathologic conditions

Research objectives

Our laboratory meets the current needs for interdisciplinary knowledge in clinical and medical engineering research activities: developing state-of-the-art medical software applications and bringing to life valuable ideas of new instruments from design to prototyping.

Services

- Hybrid CT/ultrasound imaging using electromagnetic navigation application development, for CAD (lung and digestive cancer diagnostic and stadialization);
- 3D blood vessels reconstruction and endovascular procedure simulation (coronary stenting, obstruction analysis, etc);
- Instrumentation design and prototype manufacturing for interventional radiology, trauma, endovascular applications;
- Complex equipment design and development including mechatronics systems and medical robotics;
- Computational modelling and simulation of tissues behaviour, prosthesis-tissues interaction, bone remodelling, blood flow in large vessels and capillaries, tissue perfusion.

Research Facilities and Tools

STRATASYS FORTUS 400MC - 3D professional printer builds in 11 real thermoplastics for applications that require high-performance, biocompatibility, static dissipation or resistance to heat, chemicals or UV radiation.

ELECTROMAGNETIC TRACKING SYSTEM AURORA NDI V3
Electromagnetic tracking system Aurora NDI with 5 and 6DOF sensors that it is used to develop surgery and interventional radiology instruments.

HBM QUANTUM ACQUISITION SYSTEM

Analysis and acquisition system HBM Quantum Mx840 with sensors and Catman software. This system is used for force, moments and displacements measuring and stress and strain state evaluation in mechanical assemblies.

KNEE JOINT SIMULATOR

5DOF Human Knee Joint Simulator that could be used to acquire reaction forces, contact pressure or strain for a normal or prosthetic joint. This simulator was developed in 2008 during one of our research grants.

R&D SOFTWARE

ANSYS SOLIDWORKS
MATLAB CIMATRON

Head: Assoc. Prof. Lucian GRUIONU, PhD
E-mail: lgruionu@gmail.ro

4 AXES LASAG LASER SYSTEM - has an excellent beam quality and could be used for precision cutting, drilling and welding of small parts (up to 2mm width. This is one of the world most common lasers in medical industry for instruments or stents fabrication.

VERTICAL CNC MILLING CENTRE FADAL VMX 2216

The Centre is used for milling or drilling of any complex part from virtually any material. The working area is: X=558mm, Y=406mm, Z=508mm, Precision: 0.005mm. Maximum rotation: 8000 rot/min.

HUMAN LUNG SIMULATOR

Computer controlled lung simulator actuated by 2 servomotors for abdominal and cardiac movements. The simulator includes real size airways molded in silicone and it is used to test bronchoscopy procedures instruments.

Laboratory of Mechanical Engineering

Innovative products and technologies for transportation and automotive manufacturing.

Research topics

- ⚙ Testing of road vehicles parameters under laboratory and traffic conditions
- ⚙ Research of the urban traffic
- ⚙ Development of technologies of transportation and traffic

Services

Development of experiments and scientific studies, applications and technologies for the: determination of the interdependences of the dynamic and energetic parameters of road vehicles at urban level, road traffic management; modelling and simulation of the regimes of internal combustion engines of vehicles; experimental investigation of energetic and ecologic performance of engines; studies of public transportation and active and passive safety.

Research objectives

- ⚙ study of engines at partial and full loads
- ⚙ studies of the interdependence between dynamic and energetic parameters of vehicles at the urban level
- ⚙ development of technologies for ecological vehicles
- ⚙ functional optimisation of vehicles and road traffic
- ⚙ biofuels study and implementation to internal combustion engines
- ⚙ analysis of pollutant emissions for different blends of biofuels
- ⚙ fuel consumption analysis and traffic management based on GPS technologies;
- ⚙ research on the dynamic performance specific to hybrid vehicles;
- ⚙ research on risks and vulnerability in road transport
- ⚙ research on intelligent transport systems



Head: Assoc. Prof. Ilie Dumitru, PhD
E-mail: dumitru_ilie@yahoo.com

Research Facilities and Tools

Engine Deutz 4fl 912 – testing of different biofuels, fuel consumption, partial and fullloads of the engine, pollutant emissions, noise and vibration.

ATAL AT 505 gas analyzer-measuring and recording of pollutant emission data of the studied vehicle

MSI-BR-TH-K connection signal adapter for heat-resistant Automatic adapter detection by TE (Transducer Electronic)

Mixtra traffic analysis - 16 inductive loops and 2 pneumatic valves for traffic analysis - Counting on loops: simple flow and occupation rate; mean speed; speed, lengths, inter-vehicle distance and times on 15 classes; shape classification into 15 categories using standard 2 loops and discrimination LGV/HGV with one more single loop.

DEWE-101 Miniatur Automotive Analyzer In-vehicle measurements top applications: NVH, Noise and Vibration, Vehicle dynamics, Drivability tests, Brake tests, Ride comfort tests, Road load testing, Motorcycle test, NASCAR development, Fork-lift and small vehicle test.

Temperature sensor type K
Used for air temperature measurement coupled with system DEWE-101 Miniatur Automotive Analyzer

Portable traffic analyzer
Portable traffic analyzer design for the provide accurate count, speed and classification Data, using Vehicle Magnetic Imaging (VMI)

PTV Planning & Simulation
The PTV Planning & Simulation package contains the following software for transport planning, traffic engineering and traffic simulation: PTV Visum and PTV Vissim

Gear wheel flowmeter
The flowmeter measures the flow of fuel which enters in the engine

HLD Multifunctional balance

RT 2 universal tachometer Used for measuring the engine speed

Virtual vehicle counting





RESEARCH CENTRE FOR BIOTECHNOLOGY AND BIOENGINEERING



Laboratory of Innovative Techniques and Processes in Bioengineering



Laboratory of Modelling, Identification and Control of Biochemical and Biotechnological Processes



Laboratory of Innovative Techniques and Processes in Biotechnology



Centre for Mechanical Engineering and Materials Science
Laboratory of Biomechanics

Head:
Prof. SUZANA DANOIU, PhD
E-mail: suzanadanoiu@yahoo.com

"The Research Center for Biotechnologies and Biotechnology bioengineering aims to be a catalyst for advanced research and innovation in the field biotechnology and bioengineering through industrial collaboration and partnerships."

Laboratory of Innovative Techniques and Processes in Bioengineering

Application of methods for neuromuscular and biomechanical assessment of health to increase human performance.

Research topics

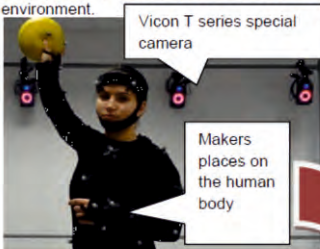
- Health
- Biomechanics
- Neuromuscular assessment

Research objectives

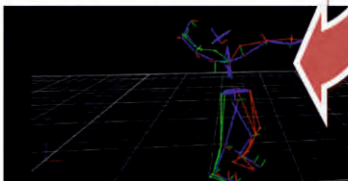
- assessment methods for the evaluation of the muscle function, integration of nervous system to human motion performance
- development of research in the field of health and application of the biomechanical and neuromuscular assessment to the design of neurorehabilitation, physical therapy and development of human physical performance

Vicon system

The Vicon is a system design to capture the movement of subjects in a laboratory, in a studio or in their real environment.



Nexus 2, Vicon's data capture software, transforms the real movement into a virtual model special developed for analysis in biomechanics.



Services

Movement analysis, neuromuscular assessment (EMG, Tensiomyography), balance assessment, gait analysis, protocols for rehabilitation in orthopedic and neurologic disorders, design of orthotic and prosthetic devices.

Approaches

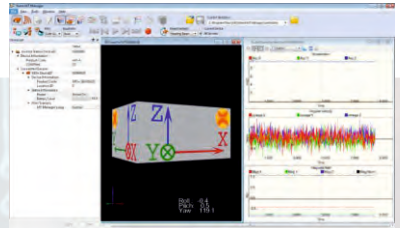
Protocols for the design of algorithm of evaluation of human body movement, and fulfillment of the goals of rehabilitation or training.

Head: Prof. Ligia Rusu, PhD
E-mail: rusuligia@ucv.ro

Research Facilities and Tools

X Sens MTw™

The X Sens MTw™ is a miniature wireless inertial measurement unit incorporating 3D accelerometers, gyroscopes, magnetometers (3D compass), and a barometer (pressure sensor). The MTw provides real-time 3D orientation for 7 wireless motion trackers in a network.

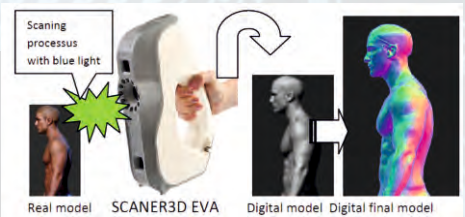


Tensiomyograph-system for neuromuscular assessment of muscle fatigue, muscle fiber type composition, muscle balance, monitoring the rehabilitation programmes.

Artec™ Eva 3D Scanner

Artec™ Eva 3D Scanner is similar to a video camera which captures in 3D with up to 16 frames per second. These frames are aligned automatically in real-time and do not require markers or research, industries and animation calibration. It captures objects quickly in high resolution and textured models. Artec Eva 3D scanner is the ideal choice for medical and biomechanical investigations.

RSScan force plate provides professional yet affordable solutions for accurate dynamic pressure measurements for biomechanical research labs, clinics, sports and leisure footwear shops and many more applications.



Advanced procedures for the modelling, identification and non-linear control of biological, biochemical and biotechnological processes, including related areas.

Research topics

- Bioprocess modelling
- Off-line identification
- On-line estimation
- Bioprocess control (nonlinear)
- Bioprocess control (adaptive)
- Bioprocess control (hybrid)
- Data acquisition
- Real-time monitoring

Research objectives

- systematic methodologies for developing various models of biochemical and biotechnological processes
- model properties analysis and the role of these properties in estimation and control
- development of novel identification and estimation methods for state and parameters of bioprocesses
- design of advanced nonlinear control strategies for some classes of bioprocesses
- the applicability of the developed research can be extended to other related areas

Services: enhanced performance in significant areas such as bioindustry, medicine and wastewater treatment can be achieved by using ultimate monitoring and control methods. Bioprocesses are complex systems, characterised by non-linearities, delays, certainties and lack of cheap and reliable sensors. The modelling, identification and control of such processes can be done by using interdisciplinary approaches (control systems, biochemistry, mathematics, informatics).

Research Facilities and Tools

Head: Prof. Eng. Dan Selișteanu, PhD
E-mail: dan.selisteanu@automation.ucv.ro

Brunswick's BioFlo®/CelliGen® 115

The New Brunswick's BioFlo/Celli Gen® (Eppendorf) is a benchtop bioreactor, designed to provide the versatility to grow a wide variety of cells. It can be used for biotechnology, pharmaceuticals, biofuels, R&D, testing labs, etc.

QNET HVAC and QNET DC Motor Control Trainers

Both tools provided by Quanser and National Instruments are useful for control teaching and research.

- QNET Heating, Ventilation and Air Conditioning Trainer for NI ELVIS platform is used for research in the field of fluid dynamics and thermodynamics control.
- QNET DC Motor Control Trainer for NI ELVIS platform is a versatile unit useful motor servo control.

CAN interface module plus simulation, implementation and testing software The equipment and the software allow the simulation, implementation and testing of CAN communication with Matlab/Simulink/State flow compatibility.

- It allows the simultaneous use of multiple CAN databases.
- It can be accessed from Matlab®/Simulink in a standard library form.
- It allows the simultaneous use of multiple CAN databases.

Experimental platform for data acquisition and control

The platform is suited to manage advanced control concepts and theories relevant to real world applications.

- Useful for develop feedback laws to control position and speed for linear cart systems.
- Allows the implementation the controllers on the actual system and evaluate its performance.

Laboratory of Innovative Techniques and Processes in Biotechnology

Research services for the Romanian business environment to increase competitiveness in agricultural and food biotechnologies, as well as in environmental protection.

Research topics

- The influence of parameters of water, soil and applied technology on productivity and quality of food products
- Monitoring of water quality and soil by GIS and GPS photogrammetric technologies
- Research on identification, quantification and capitalisation of bioactive compounds from raw materials of plant and animal origin.
- Monitoring of equipment for processing and storing of food products

Research within the Laboratory of innovative techniques and processes in biotechnologies aims at developing a system of national and international partnerships, addressing topics of interdisciplinary research and fostering participation in European research competitions.

Research objectives

The Laboratory of Innovative Technique and Processes in Biotechnology aims to capitalise on the existing expertise in the field at the University of Craiova, to create a learning environment for young people through research, and provide research services for the business environment in food and agricultural biotechnology. The research topics addressed are diverse and fall within international thematic areas: agriculture and food security, climate change, biodiversity preservation, infrared thermovision evaluation monitoring the processes for food produce storage and processing.



Head: Prof. Sina Niculina Cosmulescu, PhD
E-mail: cosmulescu.sina@ucv.ro

Research Facilities and Tools



The UltiMate 3000 / Q-Exactive (Thermo Fisher Scientific) is a UltraHigh Performance Liquid Chromatograph coupled with a High Resolution and Accurate Mass mass spectrometer (U-HPLC/HRAM MS) allowing for advanced studies of biological samples with applications in proteomics, metabolomics, lipidomics, biomarkers discovery etc.

Spectroscopy (UV-Vis; NIR Bruker, FT-IR Bruker) for spectra analysis of simple and complexes organic agricultural and food products.

Total Carbon Analyzer - TOC cube is fully automatic with a very high sample throughput and low operational costs.

The Supercritical Fluid Extraction Helix System by Applied Separations (U.S.A.) The Helix is a laboratory supercritical fluid process development unit specially engineered by Applied Separations for maximum flexibility.

TRIMBLE S6 DR PLUS total station is a robotic total station with a GPS Trimble R10 integrated, provides the power and flexibility required by today's Surveying Professionals.

GC System Thermo-Scientific with Head Space for flavors and volatile. Headspace GC is used for the analysis of volatile and semi-volatile organics in solid, liquid and gas samples. Other common applications include laboratory analysis.

Infrared Thermovision System, consists in: Infrared Camera SC 5210M (InSb detector type; 2.5 to 5 μ m waveband; resolution 320 x 256 pixels; NETD <25 mK); Infrared Camera FLIR US 440T (FPA uncooled microbolometer detector type; 7.5 to 13 μ m spectral range; resolution 324x256pixels; N.E.T.D < 0.045°C). Main goal. Infrared thermovision evaluation of materials and processes.



Laboratory of Biomechanics

Our laboratory conducts research in the field of biomechanics, biomedical engineering, rehabilitation systems, orthotics and prosthetics, exoskeletons, robotics.

Research topics

- ⊗ Biomechanics
- ⊗ Biomedical engineering
- ⊗ Rehabilitation systems
- ⊗ Exoskeletons
- ⊗ Human gait
- ⊗ Orthotics&prosthetics
- ⊗ Nonlinear dynamics of the human movement
- ⊗ Chaos theory applied in human biomechanics
- ⊗ Robotics

Research Facilities and Tools

Equipment for 3D complex analysis of human movement

Used for the kinematic and dynamic analysis of human movement, and for human vibrations analysis.

MSC. Adams Software

Used for dynamics of multibody systems, optimisation, deformable kinematic chains.

System for the capture and analysis of human movement used for human biomechanics and for mechanical systems movements.

Interdisciplinarity

- Medical sciences
- Orthopedics
- Rehabilitation
- Advanced materials
- Mechatronics
- Robotics
- Sport sciences
- CAD, FEA
- Rapid prototyping
- Mechanical systems optimisation



Research objectives

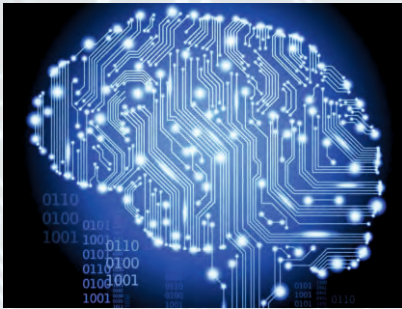
- ⊗ human gait motion rehabilitation
- ⊗ prosthetics optimisation
- ⊗ improvement of human biomechanics
- ⊗ design and optimisation of systems for human movement rehabilitation
- ⊗ innovative solutions for prosthetics and orthotics

Head: Prof. Eng. Daniela TARNIȚĂ, PhD

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RESEARCH CENTRE FOR COMPUTER SCIENCE



Laboratory of Formal Intelligence
Integration in Analysis, Simulation,
Development, Testing and Certification
of Computation Infrastructures



Laboratory of Computer Engineering



Laboratory of Advance Research in Applied Mathematics

Head:

Senior Lecturer Gabriel Stoian, PhD
Email: gabriel.stoian@incesa.ro

“Provides and promotes an advanced interdisciplinary research framework by the optimal exploitation of the centre’s resources and by development of collaborations with other researchers and with the industry in order to fulfill our mission.”

Laboratory of Formal Intelligence Integration in Analysis, Simulation, Development, Testing and Certification of Computation Infrastructures

We seek to identify innovative and intelligent solutions to solve specific challenges of communication networks.

Research topics

- Analytical characterisation of the behaviour of communications network traffic
- Identification of IT attacks based on traffic characteristics
- Determining the intrinsic characteristics of the carried information (correlation, coherency, consistency, etc.)
- Design of formal methods for automatic testing of protocol implementation compliance
- Use of intelligent agents in testing, diagnosis, and certification of communications networks
- Exploiting the advantages of mobile agents systems (cooperation, mobility, negotiation) in solving communication issues: web applications reliability, modelling of collective customer behavior
- Iot challenges: connectivity, security, complexity, adaptability, precision in terms of latency and determinism, scalability, maintenance, updates, and cloud services

Research objectives

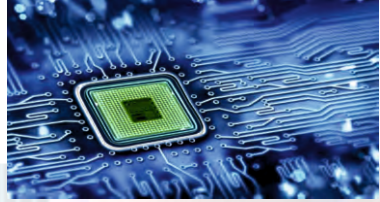
- establishing analysis methodologies in order to facilitate the diagnosis of capacities;
- design of metrics used to measure the performances of a service or a services bundle;
- solving communication network challenges by the development of mobile agents systems;
- improvement of the communication network defense capacity.

Research approaches

- testing and validation of network devices;
- testing and performance measurements of network infrastructures;
- optimisation of communication infrastructures;
- modelling and simulation.

Head: Senior Lecturer Claudiu Ionuț Popîrlan, PhD
E-mail: caludiu.popirlan@incesa.ro

Research Facilities and Tools



Ixia IxLoad

General

- Seeks test objective goals automatically, including concurrent connections, connection rate, simulated users, and throughput
- Real-world network configurations, including multiple sub-networks, unique MAC addresses, 802.1q, 802.1p, and emulated router support

Troubleshooting and analysis

- Real-time packet captures with filtering and ladder diagrams analysis
- Network diagnostics of network-layer statistics in real-time for complete insight into test operation, allowing debugging and troubleshooting of complex network configurations

VoIP

- SIP user agent, trunk and server emulation, multiple Audio CODEC supported
- Real time Quality of Voice analysis using E-Model or PESQ

IPTV, Over The Top (OTT) Video

- Emulate broadcast TV and video on demand (VOD) subscriber traffic
- Support for IGMP, MLD and multicast server source
- Perform real-time video quality analysis performed on all streams to calculate perceptual MOS on hundreds of streams

Storage

- Comprehensive NAS/SAN protocol emulation, including SMB, NFS, iSCSI, and DCBx

Wireless core

- Supports 3GPP UMTS Gn interfaces

Ixia IxVeriWave

L1-7 802.11ac testing

- Used by Wi-Fi chipset, access point (AP), wireless LAN (WLAN) controller manufacturers, service providers, and enterprises worldwide

Large-scale testing of wireless LAN

- Highly realistic client and application traffic generation enables testing of BYOD, DPI, and policy engines at scale

Comprehensive testing of Wi-Fi-enabled devices

- Performance: End-user QoE by application: voice, video, unified communications (UC), specialized (medical, retail, financial)

Pre-Deployment and Live Network and Application Assessment Tool

- Run Endpoints Anywhere – LAN, Cloud, Public
- Performance Endpoints run on “Everything”
- Centrally Manage Endpoints
- Assess Performance of NFV/Virtual Infrastructure
- Securely Access and Run Tests from Any Browser
- Application Emulation
- Voice over IP Call Emulation and Quality Assessment
- Interactive Real-Time Statistics
- 100% Software Performance Endpoints

Laboratory of Computer Engineering



Intelligent Distributed Systems, Multimedia applications, and High Performance Computing.

Research topics

- Intelligent Distributed Systems
- Multimedia Applications
- High Performance Computing

Research Facilities and Tools

Servers Dell PowerEdge R720

- 2 x Intel Xeon E5-2690, 2.90GHz, 20M Cache, 8.0GT/s QPI, Turbo, 8C, 135W, Max Mem 1600MHz
- 256GB RAM, DIMM min 1600 MHz RDIMMS
- 16x1.2TB HDD, 10K RPM, SAS 6Gbps, 2.5in Hot-plug Hard Drive
- RAID H710p, RAID5, 3-16 HDDs
- Integrated RAID Controller, 1GB NV
- Network interfaces Broadcom 5720 QP 1Gb Network Daughter Card
- Adaptor de retea Add-in: Broadcom 5719 QP 1Gb Card
- Window s Server® 2012,Standard Ed

Head: Assoc. Prof. Dan Mancaş, PhD
Email: dan.mancas@incesa.ro

Research objectives

- to contribute to the advancement of theoretical foundations, principles and technologies within computer engineering, as well as to more pragmatic issues concerning their everyday application by developing real systems and solving real-world problems
- to ensure a high performance infrastructure for the activities carried out by the research groups of the Computer and Information Technology Department of the Faculty of Automation, Computers and Electronics, University of Craiova

Blade Servers Dell Power Edge M620

- 2 x Intel Xenon E5-2670, 2.6 GHz, 8 cores
- 32 GB RAM RDIMM 1600 MHz
- RAID controller, 6 Gbps, NV cache
- Hot Plug disks support
- Network interfaces: quad port 1 Gbps + dual port 10 Gbps
- Operating system: Windows Server 2012 R2

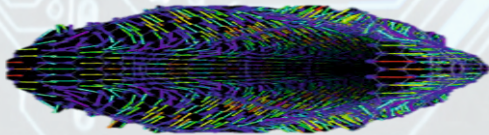
Smart IC Card Reader/Writer

- 5-7 cm Proximity Sensor Distance Reader
- Low frequency 125/134.2 kHz
- Connectivity: USB, RS232
- Supporting various operating systems

Laboratory of Advance Research in Applied Mathematics

Research topics

- ⦿ Applications of the theory of categories in the study of algebras of fuzzy logic
- ⦿ Nonsupersingular elliptic curves subspaces study with applications on digital declaration
- ⦿ Nonlinearities on elliptic curves with application in cryptanalysis
- ⦿ Nonlinear models on encoding systems



Research approaches

- ⦿ dynamics and bifurcation in dynamic systems with applications in economy and biology
- ⦿ optimisation of projection algorithms used for data analysis
- ⦿ parallelisation techniques applied for optimised iterative methods
- ⦿ fuzzy models with applications in reasoning and pattern recognition
- ⦿ nonlinear analysis with applications in mechanical engineering
- ⦿ calculus of variations with applications in non-smooth mechanics
- ⦿ applications of convex analysis in elasticity
- ⦿ optimisations problems in convex analysis
- ⦿ controllability and stability properties of partial differential equations
- ⦿ optimal and approximate control of finite-difference approximation schemes for partial differential equations

Head: Assoc. Prof. Mihaela Sterpu, PhD
Email: msterpu@yahoo.com

TO GET THERE: INCESA Partnerships



SC CEZ SA

Complex Energetic Oltenia SA

CUMMINS CRAIOVA

SC SOFTRONIC SRL

INAS SA

MPD AURORAIMPEX SRL

ELECTROPUTERE SA

ADREM INVEST

SC IPA SA, Sucursala Craiova

SC RELOC SA

Pirelli Romania

ICMET Craiova

CN Transelectrica SA



Ixia Romania

Emergency Hospital Craiova

And more...



*Dear All,
You gave us a reason to be.
You gave us reference points.
You helped us shape our ambitions.
The past and the present define us,
but the future will connect us.*



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