RENEWABLE ENERGIES GROUP

Contact details

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| Site | [http://renewable-energy.utcluj.ro](http://renewable-energy.utcluj.ro)  
| Address | 26-28 G. Baritiu Str., 400027, Cluj-Napoca, Romania |
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Areas of expertise

**Renewable Energy**  
- Develop new ways to improve energy harvesting and storing for microgrids.  
**Switched Mode Power Supplies (SMPS) and Power Electronics**  
- Study and develop new topologies in the field of SMPS.  
- Study and develop new non-linear algorithms that can be used in the field of power supplies/grid tied inverters.  
**System Modelling and Simulations**  
- Develop macro-models for the switched mode power converters in order to improve simulation times.  
**Embedded Systems**  
- Develop systems with microcontrollers in C/C++ and assembly for different types of applications: low cost, time constrained, wireless, industrial and sensing.

Team

Prof. Dr. Eng. Dorin Petreș,  
Assoc. Prof. Dr. Eng. Niculaie Palaghiță,  
Assoc. Prof. Dr. Eng. Cristian Fărcaș,  
Assoc. Prof. Dr. Eng. Alin Grama,  
Assist. Dr. Eng. Toma Pătărău,  
Assist. Dr. Eng. Radu Etz,  
Assist. Dr. Eng. Ionuț Ciocan,  
Dr. Eng. Stefan Daraban.  

Representative projects

ATM32, “Four cells galvanic bath”, PNII-IN-CI, (2014)  
ATM41, “Medical equipment for magnetic therapy with low frequency pulsed magnetic field”, 20CI-PN2-IN-CI, (2012)  
TRANS-SUPERCAP, “Energy Optimized Electrical Systems for Land Transport using Batteries and...

Significant results

The most representative publications of the past 5 years:


2. Lazar, Eniko; Petreus, Dorin; Etz, Radu; et al., Software Solution for a Renewable Energy Microgrid Emulator ADVANCES IN ELECTRICAL AND COMPUTER ENGINEERING Volume: 18 Issue: 1 Pages: 89-94 Published: 2018

3. Unguresan, Paula V.; Porumb, Raluca A.; Petreus, Dorin; et al., Orientation of Facades for Active Solar Energy Applications in Different Climatic Conditions JOURNAL OF ENERGY ENGINEERING Volume: 143 Issue: 6 Article Number: 04017059 Published: DEC 2017

4. Neamtu, Marius Ovidiu; Balan, Mugur; Petreus, Dorin; et al., CONSIDERATIONS ON A GEOTHERMAL ELECTRIC POWER GENERATOR BASED ON ORGANIC RANKINE CYCLE AS A PART OF A SMART-GRID REVUE ROUMAINE DES SCIENCES TECHNIQUES-SERIE ELECTROTECHNIQUE ET ENERGETIQUE Volume: 62 Issue: 4 Pages: 431-435 Published: OCT-DEC 2017


Significant solutions:

Power supplies with power factor correction, grid tied inverters, UPS, low/high power battery chargers from photovoltaic panels, maximum power point tracking algorithms, power optimizers for improving energy harvesting, bidirectional converters, battery equalizers, digital control applied in switched mode power supplies (DSPs, FPGA), class E amplifier for plasma generator, hybrid storage system using supercapacitors and battery packs, battery inverters, low power induction generators, energy management algorithms used in renewable energy microgrids, algorithms for sizing microgrids with renewable energies.

Products and technologies:

1. Design and implementation of switched mode power supplies/inverters; 2. Embedded programming for DSPs (dsPIC and TMS320F28/F24) and microcontrollers (Microchip, TI, Atmega, 8051) with industrial applications; 3. Design and implementation of systems for energy harvesting (photovoltaics, wind energy, geothermal and biomass); 4. Power optimizers (Distributed maximum power point tracking systems)/microinverters for energy harvesting; 5. Design and implementation of battery/supercapacitor chargers; 6. Implementation of analog/digital control; 7. Implementation of electronic systems to be used for chemical/medical experiments (plasma generator, magneto therapy, electrotherapy).

Patents: International


Patents: National

1. BIPOLAR CURRENT PULSE AMPLIFIER IN HYBRID BRIDGE WITH SYMMETRICAL CONTROL, Patent(s) no. RO128681-A2; RO128681-B1, 2018

2. Low power plasma generator at la low atmospheric pressure - OSIM Bucharest: Patent no. 128077/2016

3. Medical equipment for magnetic therapy with low frequency pulsed magnetic field: OSIM Bucharest: A/10009/2010/13 July 2010 (pending);


5. Method and electronic temperature control device for a metallic filament through indirect measurement: OSIM Bucharest: A/00732/2014, 02.10.2014 (pending)

The offer addressed to the economic environment

Research & development Supporting local industry to be more competitively on the market by using applied research.

Consulting Consultancy and applied research for the industrial or academic environment, according to the skills of the laboratory members: high efficient power supplies, digital control, embedded programming, system modeling and simulation and renewable energy.

Training Specialized courses according to the skills of the laboratory members: high efficient power supplies, digital control, embedded programming, system modeling and simulation and renewable energy.