
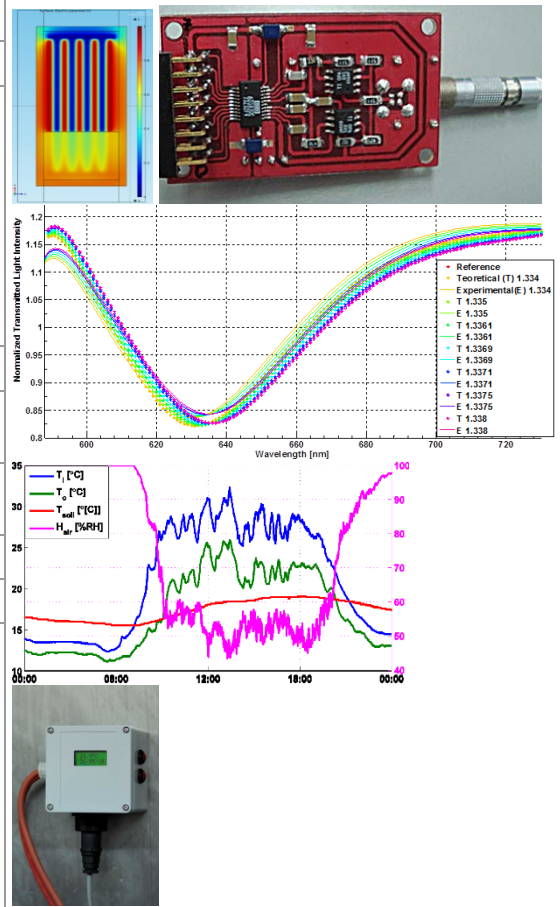


ADVANCED SENSING TECHNOLOGIES GROUP

Contact details

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Areas of expertise

Smart sensors

-Simulation and design of optical sensors, MEMS based sensors, capacitive sensors, weather instruments

Wired and wireless sensor networks

-Ultra low power wireless sensors; Environmental monitoring with sensor networks; Multipoint wired networks

Hardware/software codesign for distributed control on embedded platforms

-Smart actuators; Fault tolerant control networks; Embedded servers and HMIs

Embedded hardware design for medical devices

- Innovative immunosensors; Monitoring in post-traumatic rehabilitation; Hyperthermic chemotherapy systems; Magnetic therapy equipment

Vision based monitoring and control

-Vision based automation systems for: quality control, automation in food industry, monitoring in agriculture

Team

Prof. Dr. Eng. Daniel Moga, Prof. Dr. Eng. Dorin Petreus, Prof. Dr. Mat. Mircea Ivan, Prof. Dr. Mat. Ion Gavrea, Prof. Dr. Ion Aurel Mironiuc, Dr. Corneliu Lungoci, Dr. Traian Oniu, Assoc. Prof. Dr. Eng. Mihai Stelian Munteanu, Assoc. Prof. Dr. Eng. Ramona Galatus, Assoc. Prof. Dr. Eng. Vlad Muresan, Assoc. Prof. Dr. Mat. Bogdan Gavrea, Assoc. Prof. Dr. Eng. Eugen Vitan, Dr. Mat. Rozica Moga, Dr. Eng. Iulia Clitan, Dr. Eng. Nicoleta Stroia, Phd. Student Eng. Zsolt Barabas

Representative projects

"Hyperthermic Intra-Peritoneal Chemotherapy Equipment based on Cyber-Physical System Paradigm"

Project no. PN-II-RU-TE-357/01.10.2015, funded by the Romanian Ministry of Education and Research, UEFISCDI, (2015-2017), <http://hiper-cps.hpm.ro/>

HydroSens – "Integrated Smart Sensor System for Monitoring of Strategic Hydrotechnical Structures", PN-II-PT-PCCA-2011-nr.71, <http://hydrosens.hpm.ro> (2012-2016)

Algorithms and methods for optical signal processing (2011-2014)

Medical equipment for magnetic therapy with low frequency pulsed magnetic field - ATM41, PN2, 2012

Complex architecture for monitoring and transfer of medical data. CNCSIS 1019, (2008-2010)

Research on Test Compression and LBIST, Research contract UTCN-Philips Semiconductors, (2005-2008)

Vision based systems for monitoring and intelligent control, X2C21/ 18.07.06, (2006-2008)

Significant results

The most representative publications of the past 5 years:

1. Muresan, Vlad; Moga, Daniel; Petreus, Dorin; et al., Fault Detection and Fault Tolerance Mechanism for DC/DC Converters in Microgrids 10th IFAC Symposium on Control of Power and Energy Systems (CPES) Location: Meiji Univ, Nakano Campus, Tokyo, JAPAN Date: SEP 04-06, 2018 IFAC PAPERSONLINE Volume: 51 Issue: 28 Pages: 666-671 Published: 2018
2. Rusu, Cristian-Bogdan; Lungoci, Corneliu; Moga, Daniel; et al., Modelling a Temperature Calibration System for Medical Probes 21st International Conference on Control Systems and Computer Science (CSCS) Location: Univ Politehnica Bucharest, Bucharest, ROMANIA Date: MAY 29-31, 2017 Pages: 26-33 Published: 2017
3. D. Moga, D. Petreus, N. Stroia, „Web based solution for remote monitoring of an islanded microgrid”, *The 42nd Annual Conference of IEEE Industrial Electronics Society (IEEE IECON 2016)*, Florence, Italy, pp. 125-130, 2016.
4. Moga, Daniel; Petreus, Dorin; Muresan, Vlad; et al., Optimal generation scheduling in islanded microgrids IFAC Workshop on Control of Transmission and Distribution Smart Grids (CTDSG) Location: Prague, CZECH REPUBLIC Date: OCT 11-13, 2016 Volume: 49 Issue: 27 Pages: 135-139 Published: 2016
5. Moga, Daniel; Petreus, Dorin; Stroia, Nicoleta, Web based solution for remote monitoring of an islanded microgrid PROCEEDINGS OF THE IECON 2016 - 42ND ANNUAL CONFERENCE OF THE IEEE INDUSTRIAL ELECTRONICS SOCIETY Book Series: IEEE Industrial Electronics Society Pages: 4258-4262 Published: 2016
6. C. Lungoci, D. Moga, V. Muresan, D. Petreus, N. Stroia, R. Moga, M. Munteanu, I. Raus, V. Muntean, A. I. Mironiuc. "Hyperthermic Intraperitoneal Chemotherapy Approach Based on Cyber-Physical System Paradigm", *Journal of Control Engineering and Applied Informatics*, vol 17, no 3, pp. 50-59, 2015.
7. R. Etz, D. Petreus, T. Frentiu, T. Patarau, C. Orian, "An Indirect Method and Equipment for Temperature Monitoring and Control", *Advances in Electrical and Computer Engineering*, vol.15, no.4, pp.87-94, 2015, doi:10.4316/AECE.2015.04012
8. Juan A. Vallés and R. Gălătuș, "Requirements for gain/oscillation in Yb³⁺/Er³⁺-codoped microring resonators", *Proc. SPIE 9359, Optical Components and Materials XII, 93591R (March 16, 2015)*; doi:10.1117/12.2078657; <http://dx.doi.org/10.1117/12.2078657>
9. C. Cristea, A. Florea, R. Galatus, E. Bodoki, R. Sandulescu, D. Moga, and D. Petreus, "Innovative immunosensors for early stage cancer diagnosis and therapy monitoring", in *The International Conference on Health Informatics (Y.-T. Zhang, ed.)*, vol. 42 of IFMBE Proceedings, pp. 47-50, 2014, *Springer International Publishing*.

Significant solutions:

Low cost hardware platforms for distributed sensing; Web based monitoring software for ARM platforms; Cross platform SCADA libraries; Ultra low power 8 bit embedded platform for wireless applications; Distributed control platform for building automation; Vision based mass and volume estimation for real time measurement of moving objects; CT medical image processing for computer assisted surgery

Products and technologies:

1. Distributed sensing and control platform (embedded and PC) with applications deployed in: industrial systems health monitoring, greenhouse automation, building automation
2. Smart communications hub for sensor networks, allowing data logging, processing, bridging, storing and streaming and html browser-based visualization for multiple wired/wireless sensing devices
4. Soil humidity sensors with wired/wireless interfaces
5. Weather sensors with Modbus interface
6. Condition monitoring systems for industrial machines and equipment
7. Internet based embedded platform for condition-based maintenance support
8. Vision-based equipment for high speed sorting in food industry
9. Integrated equipment for remote control and monitoring of greenhouse fields
10. Wireless system for monitoring and control of the progressive loading of lower limb in post-traumatic rehabilitation

Patents:

1. OSIM 123261 - **System for Monitoring the Progressive Loading of Lower Limb in Post-Traumatic Rehabilitation**, 2011
2. OSIM 122976 - **System and Process for Indirectly Measuring Mass of Objects in Motion**, 2010
3. OSIM 122986 - **Contactless Coupling Circuit**, 2010
4. OSIM 122380- **Method and Device for Measuring Rotational Speed in Highly Disturbing Media**, 2009
5. OSIM 123490 - **Wireless System for Remote Tilt Measurement**, 2012

The offer addressed to companies

Research & development	Development of analytical and numerical models for sensor devices. Identification and calibration of measurement system models. Development of algorithms for sensor fault identification and isolation in control networks. Optimization of advanced digital signal processing algorithms for embedded platforms. Development of real-time measurement systems for vision based inspection and sorting. Development of real-time medical signal processing libraries.
Consulting	Consulting, design, research and prototyping in advanced sensing systems for remote monitoring Custom integrated hardware and software solutions for specific distributed control application Simulation and design of smart sensor for medical applications

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