MEDICAL ENGINEERING RESEARCH GROUP

Contact details

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Areas of expertise

- Laboratory of Biomedical instrumentation, Applied medical electronics, Clinical engineering, DSP
- Laboratory of Medical Physics, Physiological modelling, Reverse engineering of cardiovascular devices, Medical Image Analysis

Team


Representative projects

- “Management of the increase of urban mobility and methods for sustainable solutions implementation designed to satisfy long term social and economic demands in road traffic”, CEEX, (2006-2008)
- “Sensors and equipment for the quality control of various food supplies”, PN II, (2007-2013)
- “Research and implementation of a physiotherapy equipment using the energy of light in visible spectrum”, (2007)
- “Software applications and experimental investigations of the cavitation phenomenon in mechanical heart valves”, PNII-Idex, (2005-2008)

Significant results

The most representative publications of the past 5 years:


11. N.M. Roman; S. Gergely; F. Roman R.V.Ciupa, “Low-cost ECG Wireless with Embedded Fuzzy Diagnosis System”, in *Journal of Medical and Biological Engineering*, vol. 30, no. 4, 2010, 253-259


16. P. Bechet, R. Mitran, M. Munteanu, “A non-contact method based on multiple signal classification algorithm to reduce the measurement time for accurately heart detection”, in *Review of Scientific Instruments*, vol. 84, no. 8


Significant solutions:
1. High efficiency solution for medical telemetry ECG. Proved method in pathological PCG analysis. Efficient mathematical algorithms used in biomedical signal processing. Development of portable biomedical instrumentation, Virtual medical devices, Biomedical sensors
2. High accuracy reconstruction of the 3D geometry of vessels, cavities and cardiovascular devices; Development of a multiscale CFD-FSI double-valve model of the left ventricle to study the valve-valve interaction; Experimental and computational study of the hemolytic and cavitation effects of bileaflet mechanical heart valves; Computational analysis of thrombus absorption efficiency for different commercial catheter designs; Computational assessment of high frequency electromagnetic (cell phone) field effects on implanted carotid stents;

Products and technologies:
Low consumption battery powered DSP devices for ECG and PCG signal analysis

The offer addressed to the economic environment

Research & development
Datronix Computer Ltd., Cluj-Napoca, [www.datronix.ro](http://www.datronix.ro)
National Institute for Research and Development of Isotopic and Molecular Technologies [www.itim-cj.ro](http://www.itim-cj.ro)
Military Emergency Hospital Dr. Constantin Papilian, Cluj-Napoca, [www.smucluj.ro](http://www.smucluj.ro)
County Emergency Hospital Bistrita-Nasaud, [http://spital.bistrita.ro/](http://spital.bistrita.ro/)

Consulting
Consulting in the areas of medical image processing, FDA regulations of cardiovascular devices,

Training
CFD-FSI analysis, Multiphysics and multiscale modelling, Computational methods for cardiovascular devices design, Computational methods for electromagnetic dosimetry