


INTELLIGENT EMBEDDED SYSTEMS

Contact details

Name	Intelligent Embedded Systems	
Acronym	IES	
Logo		
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Areas of expertise

Intelligent embedded systems: Implementation of Intelligent embedded systems using field programmable gate areas (FPGA) having learning capabilities and adaptive behaviour
Hardware implementation of artificial neural networks in FPGA circuits
Modern technologies for distributed software systems
Intelligent sensors devices, adaptive interfaces with hardware implemented artificial neural networks
Intelligent acquisition systems
Assistive robots and ambient assisted living platforms
Information representation. Data coding and compression techniques.

Team

Assoc. Prof. Dr. Eng. Oniga Ștefan, Assoc. Prof. Dr. Eng. Cosma Ovidiu, Assist. Prof. Dr. Eng. Buchman Attila, Dr. Eng. Costea Cristinel

Representative projects

Electronic Nose, "Contributions regarding the study, the synthesis and the implementation of certain applications using systems with intelligent sensors" CNCISIS Contract No. 602/2007, code TD-277.
"Research regarding the implementation of a neural network used to process signals generated by the muscular and nervous system." CNCISIS Contract No. 171/02.10.2007, TD-11.

Significant results

The most representative publications of the past 5 years

1. Oniga Ștefan, Jozsef Sueto, Optimal Recognition Method of Human Activities Using Artificial Neural Networks MEASUREMENT SCIENCE REVIEW, Vol. 15, Issue 6, Pp.323-327, Published: DEC 2015
2. Sabou Sebastian, Oniga Ștefan, Lung Claudiu, "Magnetic sensors in inertial navigation system", *20th IEEE International Symposium on Design and Technology in Electronic Packaging (SIITME)*, Bucharest, ROMANIA, Oct 23-26, 2014, Pp. 211-214, Published: 2014
3. Orha I., Oniga S., "Study regarding the optimal sensors placement on the body for human activity recognition", *20th IEEE International Symposium on Design and Technology in Electronic Packaging (SIITME)*, Bucharest, ROMANIA, OCT 23-26, 2014, Pp. 203-206, Published: 2014
4. S. Oniga, J. Vegh, I. Orha, "Intelligent Human-Machine Interface Using Hand Gestures Recognition", *Automation Quality and Testing Robotics (AQTR), 2012 IEEE International Conference on*, pp. 559 – 563.
5. O. Cosma, Hiding secret data into a carrier image, *Carpathian Journal of Electronic and Computer Engineering* 2012 Vol. 5 no. 1, ISSN: 1844 – 9689, pp. 53-56.
6. E. Monmasson, L. Idkhajine, M. N. Cirstea, I. Bahri, A. Tisan, M. W. Naouar, FPGAs in Industrial Control Applications, *IEEE Transactions on Industrial Informatics*, vol.2, issue 2, 2011, pp. 224-243.
7. O. Cosma, A method of uneven image compression for increasing the accuracy of relevant areas, *Carpathian Journal of Electronic and Computer Engineering* vol. 3 2010, ISSN 1844-9689, pp. 9-12.
8. A. Tisan, M. Cirstea, A. A. Buchman Parera, S. Oniga, D. Ilea, Holistic modeling, design and optimal digital control

of a combined renewable power system, *IEEE International Symposium on Industrial Electronics*, ISIE 2010; Bari; 4-7 July 2010, ISBN: 978-142446391-6, pp. 2733-2738.

9. A. Tisan, M. Cirstea, S. Oniga, A. Buchman, "Artificial olfaction system with hardware on-chip learning neural networks", *12th International Conference on Optimization of Electrical and Electronic Equipment*, OPTIM 2010, ISSN: 1842-0133, ISBN: 978-1-4244-7020-4, pp. 884-889.
10. S. Oniga, A. Tisan, C. Lung, A. Buchman, I. Orha, "Adaptive Hardware-Software Co-Design Platform for Fast Prototyping of Embedded Systems", *12th International Conference on Optimization of Electrical and Electronic Equipment*, OPTIM 2010, ISSN: 1842-0133, ISBN: 978-1-4244-7020-4, pp. 1004-1009.
11. C. Costea, Load Frequency Control using Multi-Agent Consensus, *Proceedings of the International Conference on Optimization of Electrical and Electronic Equipment*, OPTIM, 2010, pp. 1269-1274, ISSN: 1842-0133 ISBN: 978-1-4244-7019-8.
12. O. Cosma, The efficiency of the image subband coding algorithms based on zerotrees, *Creative Mathematics and Informatics* vol. 18 no.2, 2009 ISSN 1584 – 286X, pp.153-158.
13. D. Mic, A. Tisan, S. Oniga, C. Lung, S. Sabau, The Development of a Simulink Library with FPGA Compatible Parametric Components for Electric Machines Control, in *Proceedings of the International Symposium on Signals, Circuits and Systems*, July 09-10, 2009, Iasi Romania, Vol. 1 and 2, pp. 561-564.
14. Oniga, A., Tisan, D., Mic, C., Lung, I., Orha, A., A. Buchman, Vida-Ratiu, A., 2009, FPGA Implementation of Feed-Forward Neural Networks for Smart Devices Development, *ISSCS 2009: in Proceedings of the International Symposium on Signals, Circuits and Systems*, Vol. 1 and 2, pp. 401-404, WOS:000275854200099.
15. V. Nasui, A. Buchman, Implementation of a high resolution velocity sensor using an optical quadrature shaft encoder for electromechanical linear actuators, *Advanced Topics in Optoelectronics, Microelectronics, and Nanotechnologies IV*, 28-31 august, Constanta, Romania, ISBN 978-973-755-387-4, Proc. SPIE, Vol. 7297, 729725, 2009; doi:10.1117/12.823689.
16. D. Mic, S. Oniga, E. Micu, C. Lung, Complete hardware/software solution for implementing the control of the electrical machines with programmable logic circuits, OPTIM: *Proceedings of the 11th International Conference on Optimization of Electrical and Electronic Equipment*, May 22-23, 2008 Brasov Romania, VOL III, pp. 107-114.
17. St. Oniga, A. Tisan, D. Mic, A. A. Buchman Vida-Ratiu, Optimizing FPGA implementation of feed-forward neural networks, *International Conference on Optimization of Electrical and Electronic Equipment OPTIM 2008*, Brasov, Romania, May 22-23, Vol. IV, pp. 31-36.
18. A. Tisan, S. Oniga, C. Gavrincea, A. Buchman, FPGA Implementation of a self-organized map with on-chip learning, *International Conference on Optimization of Electrical and Electronic Equipment OPTIM 2008*, Brasov, Romania, May 22-23, Vol. IV, pp. 81-86, IEEE Catalog Number 08EX1996, ISBN 1-4244-1544-6.
19. C.Costea, A. L. Dicso, A distributed control for interconnected systems, *IEEE International Conference on Automation Quality and Testing Robotics, (AQTR)*, 2012 pp.74 - 78, INSPEC Accession Number: 12853508.
20. O. Cosma "Image Compression with a human touch", *Creative Mathematics and Informatics* vol. 17 no. 2, 2008, ISSN: 1584 – 286X, pp. 93-100.

Oniga Stefan – AGEPI Medal - International Fair of Inventions and Practical Ideas "INVEST-INVENT SIR 21" – Gesture recognition system

The offer addressed to the economic environment

Research & development	<ul style="list-style-type: none"> Hardware implementation of artificial neural networks in FPGA circuits. Development of neural network's specific blocks for rapid prototyping of application specific neural networks Intelligent sensors network Adaptive interfaces with learning capabilities able to adapt to the input signals changes Multi-agent systems Ontologies and evolutionary computation Computer networks, routing protocols Development of an intelligent platform (with learning capabilities and adaptive behaviour) for health condition monitoring of elderly or persons with disabilities, using wearable wireless sensor Mobile applications
Consulting	<ul style="list-style-type: none"> Embedded systems with microcontrollers and PLDs Data acquisition systems Computer networks Graphics and Image Processing
Training	<ul style="list-style-type: none"> Design with microcontrollers Design with FPGA circuits C/C++, Java, PHP programming languages Databases, Web programming, Computer networks