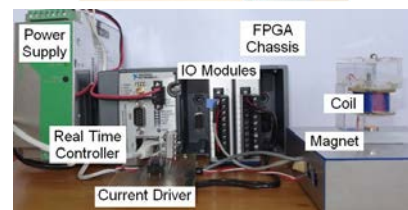
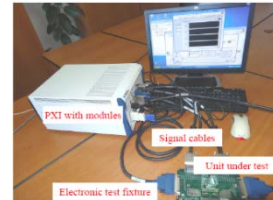
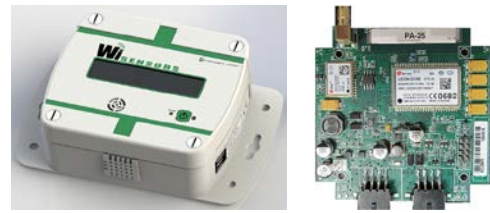


## WIRELESS SENSOR - APPLICATIONS

### Contact details

Name	Wireless Sensor - Applications
Acronym	WS-App
Logo	
Site	<a href="http://research.utcluj.ro/tl_files/research/Research%20Domain/Systems%20Engineering/5_Folea.pdf">http://research.utcluj.ro/tl_files/research/Research%20Domain/Systems%20Engineering/5_Folea.pdf</a>
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### Areas of expertise

#### Embedded system design

- The design and development of embedded systems based on microcontrollers, having sensor measuring and transmission capabilities; power harvesting.

#### Tracking system

- Location determination systems based on GPS, on RSSI and Wi-Fi or on GSM.

#### Advanced process control

- The development of advanced control systems on industrial real-time platforms which include FPGA chips; graphical programming.

### Team

**Assoc. Prof. Eng. Silviu Folea, PhD**, Assist. Prof. Eng. George Mois, PhD; Assist. Prof. Eng. Mihai Hulea, PhD; Master student Eng. Izabela Bîrs; Master student Eng. Mircea Căprioru.

### Representative projects

“**Sub 1 GHz ISA100 technology for low cost and low power consumption embedded systems**”, TETRACOM – 3rd Call for TTP Proposals (FP7), Partial Funding for Academia-Industry Technology Transfer Projects in Computing Systems, Technology Transfer in Computing Systems, 50k EUR, 1.01-30.06.2016,

<http://es.iet.unipi.it/tetracom/content/index.php/funded-projects>

“**Power Harvesting Ambient Beacon for the IoT**”, Accenture Industrial Software Solutions (AISS), Grant - Industrial Internet of Things (IIoT), 1.02-31.07.2016, <http://research.utcluj.ro/index.php/lansare-competitii-firme.html>

“**WAIST: Wireless Applications for Satellite Assembly Integration and Testing Applications**”, nr. 4000108133, Control Data Systems SRL (CDS) and Thales Alenia Space France (TAS-F), contract with European Space Agency (ESA) nr. AO7169, (2015-2016), <http://www.cds.ro/#portfolioModal1>

“**Wi-Sensors CO<sub>2</sub> for temperature, humidity and CO<sub>2</sub> measurement**”, project with Synchro Comp SRL, Craiova, Romania, (2013-2014),

[http://www.synchro.ro/en-us/Shop/ProdID/1716/CatID/319/LCD\\_WiSensor\\_with\\_T\\_RH\\_and\\_CO2\\_Internal\\_Probes](http://www.synchro.ro/en-us/Shop/ProdID/1716/CatID/319/LCD_WiSensor_with_T_RH_and_CO2_Internal_Probes)

### Significant results

#### The most representative publications of the past 3 years:

1. Folea, S.; Mois, G.; Muresan, C.I.; Miclea, L.; De Keyser, R.; Cirstea, M., " A Portable Implementation on Industrial Devices of a Predictive Controller using Graphical Programming," in *Special Session on Industrial Informatics, IEEE Transactions on Industrial Informatics*, accepted for publication on January 27, 2016.
2. G. Mois, T. Sanislav, S. Folea, "A Cyber-Physical System for Environmental Monitoring," *IEEE Transactions on Instrumentation & Measurement*, 2016, in press
3. Folea, S.; Enyedi, S., Miclea, L., Hedeşiu, H., "Reconfigurable Test Platform for Modular Embedded Systems in Manufacturing Processes" in *International Design and Test Symposium 2015, IDT2015*, Jordan

4. Folea, S.; Mois, G.; Muresan, C.I.; Miclea, L.; De Keyser, R.; Cirstea, M., "Implementation of an extended prediction self-adaptive controller using LabVIEW™," in *Industrial Informatics (INDIN), 2015 IEEE 13th International Conference on*, vol., no., pp.883-888, 22-24 July 2015, doi: 10.1109/INDIN.2015.7281852
5. T. Sanislav, G. Mois, S. Folea, L. Miclea, „*Integrating Wireless Sensor Networks and Cyber Physical Systems: Challenges and Opportunities*”, Book title „Cyber-Physical System Design with Sensor Networking Technologies”, Sherali Zeadally, Nafaa Jabeur, 2015, publisher The Institution of Engineering and Technology, ISBN: 978-1849198240.
6. Folea, S.; Muresan, C.I.; De Keyser, R.; Ionescu, C.M., “Theoretical Analysis and Experimental Validation of a Simplified Fractional Order Controller for a Magnetic Levitation System,” *Control Systems Technology, IEEE Transactions on*, no.99, pp.1, 1 2015, doi: 10.1109/TCST.2015.2446496, ISI Journal, 2.474.
7. Folea, S.C.; Mois, G., “A Low-Power Wireless Sensor for Online Ambient Monitoring,” *Sensors Journal, IEEE*, vol.15, no.2, pp.742, 749, Feb. 2015, doi: 10.1109/JSEN.2014. 2351420, ISI Journal, 1.852.
8. C. I. Muresan, C. Ionescu, S. Folea, R. DeKeyser, „Fractional Order Control of Unstable Processes: The Magnetic Levitation Study Case”, *Nonlinear Dynamics*, special issue entitled "Fractional Dynamics and Its Applications" NODY-D-14-00037R1, March 2014, ISSN: 0924-090X, ISI Journal, 2.419.
9. C. I. Muresan, S. Folea, G. Mois, E. H. Dulf, “Development and Implementation of an FPGA Based Fractional Order Controller for a DC Motor”, *Elsevier, Mechatronics*, Volume 23, Issue 7, October 2013, pg. 798–804 ISSN: 0957-4158, ISI Journal, 1.823.
10. B. Muresan, S. Folea, I. Nascu, C. Ionescu, R. DeKeyser, “System identification and modelling of a miniature coaxial helicopter”, in *Simulation: Transactions of the Society for Modeling and Simulation International*, vol. 89, no. 12, 2013, pg. 1490-1504
11. S. Folea, M. Hulea, G. Mois, V. Cosma, “Wi-Fi Portable Detector Solution for Distributed Radon Measurements”, in *Romanian Journal of Physics*, vol. 58, S126, 2013
12. S. Folea, C. Marcu, D. Bordencea, H. Valean, “Indoor Localization Using Wi-Fi Low Power Devices”, *36th International Conference on Telecommunications and Signal Processing (TSP2013)*, July 2-4, 2013, Rome, Italy
13. C. I. Muresan, G. Mois, S. Folea, C. Ionescu, “Alternative Implementations of a Fractional Order Control Algorithm on FPGAs”, *ReConFig'13, 2013 International Conference on ReConfigurable Computing and FPGAs*, Cancun, Mexico, Dec. 9-11, 2013
14. M. Hulea, G. Mois, S. Folea, L. Miclea, V. Biscu, “Wi-Sensors: a Low Power Wi-Fi Solution for Temperature Measurements”, *39th Annual Conference of the IEEE Industrial Electronics Society (IECON 2013)*, 10-13 Nov. 2013, Vienna, Austria, pg. 4011-4015

**Significant solutions:**

Wireless sensors based on Wi-Fi low power, BLE (Bluetooth Low Energy) or ISA100.11a.  
Development and implementation of advanced control methods on dedicated industrial systems.

**Products and technologies:**

Electronic equipment design, dedicated solutions. Hardware and software implementation.

**International Patents:**

1. A. Aștilean, T. Leția, S. Folea, C. Avram, M. Hulea, R. Miron, E. Ciupan, „*Sistem și metodă securizată de comunicație între dispozitive fixe și mobile*”, Brevet RO 127706 A2, nr. UTC-N 1000003415.
2. M. Ghercioiu, H. Hedesiu, S. Folea, G. Crisan, C. Ceteras, I. Monoses, “*Compact modular embedded device*”, United States Patent 7860582B2, 12/28/2010
3. M. Ghercioiu, H. Hedesiu, S. Folea, G. Crisan, C. Ceteras, I. Monoses, “*Deployment and execution of a graphical program on an embedded device from a PDA*”, United States Patent 7647562B2, 01/12/2010

**The offer addressed to the economic environment**

Research & development	The development of hardware equipment and of software products for new structures of data acquisition and communication. The design of dedicated measurement and wireless communication equipment and of location tracking equipment in open air using GPS or GSM or in industrial halls and office buildings using other technologies. The development, the simulation and the testing of advanced control methods, their implementation on industrial control systems.
Consulting	Consulting activities for the development of distributed monitoring and control applications utilizing wireless communication.
Training	LabVIEW™ courses and introduction to digital design using LabVIEW™ and VHDL; Java object oriented programming courses with applicability to distributed control systems; Electronic equipment design; Firmware development; Advanced control of industrial processes.