

RAPID PROTOTYPING DESIGN IN CONTROL SYSTEMS

Contact details

Name	Rapid Prototyping Design in Control Systems
Acronym	RADECO
Logo	
Site	http://users.utcluj.ro/~dobra/RADECO.php http://research.utcluj.ro/tl_files/research/Research%20Domain/Systems%20Engineering/7_Dobra.pdf
Address	26-28, G. Baritiu Str., room G2, 400027, Cluj-Napoca, Romania
Faculty Department	Faculty of Automation and Computer Science Department of Automation
Telephone	Automation Department
Fax	+40 264 401433
Director	Prof. Dr. Eng. Petru Dobra
e-mail	Petru.Dobra@aut.utcluj.ro



Areas of expertise

Digital Control of electrical drives for CNC machines.
Electrical drives for industrial robots.
Equipment Setup for building automation;
Embedded systems for intelligent environment.

Team

Prof. Dr. Eng. Petru Dobra, Assist. Dr. Eng. Valentin Sita, Assist. Prof. Dr. Eng. Mirela Dobra, Dr. Eng. Liviu Tomesc, Dr. Eng. Bogdan Betea, PhD Costandin Marius

Representative projects

“The platform embedded for controlling a solar thermal cooling system suitable for small / medium scale cooling applications”, 2014-2015, internal research project financed by TUCN
VISICOM, “Vision Bases Systems for Intelligent Control and Monitoring”, CEEX NR.X2C21/18.07.2006
“Research on sensors technology and design algorithms for signal processing”, Research Contract nr.22520/30.11.2005 UTC-N – MultiPRO Amsterdam, (2005-2006)
RADEPA, “Rapid development of prototyping for actuators systems”, CNCSIS 1257/2005
“PLC equipment for fault detection and isolation in electrical drives and sensors systems”, Research Grant CNCSIS tip E, nr. 108/2004
“H[∞] techniques for fault detection and isolation in electrical drives and sensors systems”, research grant CNCSIS AT 230/2001 & 48/2003

Significant results

The most representative publications of the past 5 years:

1. Fratean, Adrian; Dobra, Petru, Control strategies for decreasing energy costs and increasing self-consumption in nearly zero-energy buildings SUSTAINABLE CITIES AND SOCIETY Volume: 39 Pages: 459-475 Published: MAY 2018
2. Costandin, Marius; Costandin, Benjamin; Dobra, Petru, Nonlinear Model and Trajectory Control of A Novel VTOL Vehicle II Conference: INTERNATIONAL CONFERENCE ON UNMANNED AIRCRAFT SYSTEMS (ICUAS) Location: Dallas, TX Date: JUN 12-15, 2018 Book Series: International Conference on Unmanned Aircraft Systems Pages: 806-815 Published: 2018
3. Costandin, Marius; Dobra, Petru, Derivation of Nonlinear Mathematical Model of Two-Wheeled Inverted Pendulum 2017 21ST INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing Pages: 94-99 Published: 2017
4. Rusu, Andrei; Dobra, Petru, The implementation of an ARM-based low-power wireless process control system 2017 21ST INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing Pages: 666-670 Published: 2017

5. Fratean, Adrian; Dobra, Petru; Carutasu, Mihail-Bogdan, Dynamic temperature setpoint control as a strategy for reducing costs and energy consumption in nearly zero-energy buildings 2017 21ST INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing Pages: 677-682 Published: 2017
6. Sita Ioan-Valentin, Dobra Petru, Moga Daniel, et al., "Optimization of Residential Heating Systems Using Accumulators", *IEEE 15th International Conference on Environment and Electrical Engineering (EEEIC)*, Rome, ITALY, JUN 10-13, 2015, Pp. 2165-2170, Published: 2015
7. D. Moga, I. Sita, N. Stroia, P. Dobra, R. Moga, D. Petreus, "Sensing and Control Strategies in Tracking Solar Systems", *20th International Conference on System Controls and Computer Science 2015*, Bucharest, ROMANIA, Vol.2, pag. 989-995, 2015.
8. Farcas Alin C., Dobra Petru, "Adaptive control of membrane conductivity of PEM fuel cell", *7th International Conference on Interdisciplinarity in Engineering (INTER-ENG)*, Tirgu Mures, Romania, Oct 10-11, 2013 Vol.12, Pp.42-49, Published: 2014
9. Sita Ioan-Valentin, Dobra Petru, "KNX building automations interaction with City Resources Management System" *7th International Conference on Interdisciplinarity in Engineering (INTER-ENG)*, Tirgu Mures, Romania, Oct 10-11, 2013, Vol. 12, Pp. 212-219, Published: 2014
10. Duma Radu, Trusca Mirela, Dobra Petru, "Embedded Rapid Control Prototyping: Bldc Motor Control", *Proceedings Of The Romanian Academy Series A-Mathematics Physics Technical Sciences Information Science*, Vol.14, Issue 2, Pp.144-151, Published 2013
11. Sita Ioan-Valentin, Dobra Petru, "Universal Communication Node for Building Automation Systems", *Int Conf on Smart Syst in all Fields of the Life-Aerospace, Robot, Mech Engr, Mfg Syst, Biomechatron, Neurorehabilitat and Human Motricities*, Bucharest, Romania Date: OCT 24-27, 2013, Engineering Decisions and Scientific RESEARCH In Aerospace, Robotics, Biomechanics, Mechanical Engineering and Manufacturing, Book Series: Applied Mechanics and Materials, Vol. 436, Pp. 435-444, Published: 2013
12. Sita Ioan-Valentin, Dobra Petru, Dobra Mirela, et al., "Household Water Tank Temperature Control", *Int Conf on Smart Syst in all Fields of the Life-Aerospace, Robot, Mech Engr, Mfg Syst, Biomechatron, Neurorehabilitat and Human Motricities*, Bucharest, ROMANIA OCT 24-27, 2013, Engineering Decisions And Scientific Research In Aerospace, Robotics, Biomechanics, Mechanical Engineering And Manufacturing, Book Series: Applied Mechanics and Materials, Vol.436, Pp. 417-426, Published: 2013
13. R. Duma, M. Truşcă, P. Dobra, "Tuning and Implementation of PID Controllers using Rapid Control Prototyping", in *Control Engineering and Applied Informatics Journal*, vol. 13, no. 4, 2011, pp. 64-73
14. R. Duma, P. Dobra, M. Trusca, "Embedded application of fractional order control", in *Electronic Letters*, vol. 48, no. 24, 2012, pp. 1526-1528

Significant solutions:

Golden Medal, Innova, Bruxelles, 2011, "Automatic system for the analysis of electrical energy quality", Radu Munteanu, Petru Dobra, Daniel Moga, Radu Adrian, Munteanu, Mihai Stelian Munteanu, Mirela Truşcă, Dorin Petreuş, Valentin Sita

The offer addressed to the economic environment

Research & development	<p>Digital control system development for electrical drives with BLDC and PMSM motors</p> <ul style="list-style-type: none"> - implementation of EPLAN and Autocad Electrical projects; - ladder and C++ programming; - implementation of SCADA graphical interfaces; - control algorithms in Matlab, Labview; <p>Upgrade, replacement or retrofitting electrical drives for</p> <ul style="list-style-type: none"> - medium CNC machines - industrial robots with DC / Stepper / BLDC/ PMSM motors - configuring PLC's (Siemens, Omron). <p>Equipment Setup for building automation;</p> <ul style="list-style-type: none"> - PLC based automation systems; - energy resources management; - using KNX and LOGO! Controllers.
Consulting	<p>Microcontrollers/PLC/ FPGA programing environments, data acquisition procedures Programming in C, C++, PHP, Java, Matlab; Home Automation Configuring (KNX and LOGO! Controllers)</p>
Training	<p>Implementing Embedded Control Systems for:</p> <ul style="list-style-type: none"> - electrical drives (DC motors, BLDC motors, PMSM motors) - inteligente sensors systems (temperature, humidity, pressure) - home automation (KNX and LOGO! Controllers)