RAPID PROTOTYPING DESIGN IN CONTROL SYSTEMS

Contact details

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Acronym	**RADECO**	
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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. Drd. Eng. Mircea Şuşcă, Assist. Drd. Eng. Dora Laura Morar, Assist., Drd. Eng. Vlad Mihaly, Dr. Eng. Marius Costandin, Dr. Eng. Vasile Boancă

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, Technical and economic viability of greenfield large scale photovoltaic plants in Romania, SUSTAINABLE ENERGY TECHNOLOGIES AND ASSESSMENTS 2213-1388, 2213-1396 OCT, 2022, 53 A , 10.1016/j.seta.2022.102486, WOS:000847202800010
2. Mihaly, Vlad; Susca, Mircea; Morar, Dora; Dobra, Petru, Sensitivity Analysis of Krasovskii Passivity-Based Controllers, MATHEMATICS, 2227-7390 OCT, 2022, 10, 20,10.3390/math10203750, WOS:000875873300001
3. Susca, Mircea; Mihaly, Vlad; Morar, Dora; Dobra, Petru, Sampling Rate Optimization and Execution Time Analysis for Two-Degrees-of-Freedom Control Systems, MATHEMATICS , 2227-7390 OCT, 2022, 10, 19 10.3390/math10193449, WOS:000867182800001
4. Fratean, Adrian; Dobra, Petru, A Case Study for the Optimal Residential Battery Size and Dispatch Control in the Energy Market Context in Romania, PROCEEDINGS OF 2022 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR 2022), 23rd IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR), MAY 19-21, 2022, Cluj Napoca, ROMANIA, 1844-7872 978-1-6654-7933-2 2022 159, 164, 10.1109/AQTR55203.2022.9802010, WOS:000890261900027
5. Janos, Oliver; Dobra, Petru, H-infinity Controller Design and Parametric Identification for a DC Brushed Motor,

PROCEEDINGS OF 2022 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR 2022), 23rd IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR), MAY 19-21, 2022, Cluj Napoca, ROMANIA, 1844-7872 978-1-6654-7933-2 2022 189, 194, 10.1109/AQTR55203.2022.9801991, WOS:000890261900032

6. Mihaly, Vlad; Susca, Mircea; Dulf, Eva H.; Dobra, Petru, Approximating the Fractional-Order Element for the Robust Control Framework, 2022 AMERICAN CONTROL CONFERENCE (ACC), American Control Conference (ACC), JUN 08-10, 2022, Atlanta, GA , 978-1-6654-5196-3 2022 1151, 1157 WOS:000865458701030

7. Mihaly, Vlad; Susca, Mircea; Morar, Dora; Dobra, Petru, Polytopic Robust Passivity Cascade Controller Design for Nonlinear Systems, 2022 EUROPEAN CONTROL CONFERENCE (ECC), European Control Conference (ECC), JUL 12-15, 2022, London, ENGLAND , 978-3-907144-07-7 2022 2105, 2110 WOS:000857432300292

8. Costandin, Marius, and Petru Dobra. "Polynomial trajectory generation and tracking for linear systems." International Journal of Control (2019): 1-10.

9. Mihaly, Vlad, Mircea Susca, and Petru Dobra. "Passivity-Based Controller for Nonideal DC-to-DC Boost Converter." 2019 22nd International Conference on Control Systems and Computer Science (CSCS). IEEE, 2019.

10. 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

11. Costandin, Marius; Costandin, Beniamin; 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

Significant solutions:

Golden Medal, Innova, Brusselles, 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	**Digital control system development for electrical drives with BLDC and PMSM motors** - implementation of EPLAN and Autocad Electrical projects; - ladder and C++ programming; - implementation of SCADA graphical interfaces; - control algorithms in Matlab, Labview; **Upgrade, replacement or retrofitting electrical drives for** - medium CNC machines - industrial robots with DC / Stepper / BLDC/ PMSM motors - configuring PLC's (Siemens, Omron). **Equipment Setup for building automation;** - PLC based automation systems; - energy resources management; - using KNX and LOGO! Controllers.
Consulting	Microcontrollers/PLC/ FPGA programing environments, data acquisition procedures Programming in C, C++, PHP, Java, Matlab; Home Automation Configuring (KNX and LOGO! Controllers)
Training	Implementing Embedded Control Systems for: - electrical drives (DC motors, BLDC motors, PMSM motors) - inteligente sensors systems (temperature, humidity, pressure) - home automation (KNX and LOGO! Controllers)

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