

# **10th IFAC Symposium on Advances in Control Education 2013**

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**Editors:**

**Sebastian Dormido**

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## Content List of 10th IFAC Symposium Advances in Control Education

### Technical Program for Wednesday August 28, 2013

<b>WeA1</b>	Portobello Building: Room A
<b>PID Control Education</b> (Invited Session)	
Chair: Visioli, Antonio	Univ. of Brescia
Co-Chair: Arrieta, Orlando	Univ. of Costa Rica
11:00-11:20	WeA1.1
<i>A New Extensive Source for Web-Based Control Education - ContLab.eu (I)</i> , pp. 1-6.	
Cech, Martin	Univ. of West Bohemia in Pilsen
Balda, Pavel	Univ. of West Bohemia
Schlegel, Milos	Univ. of West Bohemia in Pilsen
11:20-11:40	WeA1.2
<i>Raspberry Pi and Arduino Boards in Control Education (I)</i> , pp. 7-12.	
Sobota, Jaroslav	Univ. of West Bohemia in Pilsen
Pišl, Roman	Univ. of West Bohemia in Pilsen
Balda, Pavel	Univ. of West Bohemia
Schlegel, Milos	Univ. of West Bohemia in Pilsen
11:40-12:10	WeA1.3
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Benavides, Yeison	Univ. of Costa Rica
Alfaro, Victor	Univ. of Costa Rica
Arrieta, Orlando	Univ. of Costa Rica
Vilanova, Ramon	Univ. Autònoma de Barcelona
12:00-12:20	WeA1.4
<i>Low Cost Setup to Support PID Ideas in Control Engineering Education (I)</i> , pp. 19-24.	
Coelho, Antonio Augusto Rodrigues	Federal Univ. of Santa Catarina
Lopes Junior, Carlos Alberto Araujo	UFSC-DAS
Aldeyturriaga, Ricardo Oliveira Gonzalez	UFSC-DAS
Silveira, Antonio da Silva	Federal Univ. of Santa Catarina
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<i>Teaching a Conscious Use of PI/PID Tuning Rules (I)</i> , pp. 25-30.	
Leva, Alberto	Pol. di Milano
Papadopoulos, Alessandro Vittorio	Pol. di Milano, Dipartimento di Elettronica e Informazione
<b>WeA2</b>	Portobello Building: Room B
<b>Teaching Aids for Control Engineering (I)</b> (Regular Session)	
Chair: Lee, Tom	Quanser
Co-Chair: Vachhani, Leena	Indian Inst. of Tech. Bombay
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Hoppe, Matthias	RWTH Aachen
Schrödel, Frank	RWTH Aachen Univ.
Reiter, Matthias	RWTH Aachen
Maschuw, Jan Philipp	RWTH Aachen Univ.
Arenbeck, Henry	RWTH Aachen
Abel, Dirk	RWTH-Aachen Univ.
11:20-11:40	WeA2.2
<i>Visual Laboratory Curriculum for Modern Control Systems</i> , pp. 37-42.	
Lee, Tom	Quanser
Ben Mrad, Ridha	Univ. of Toronto
Martin, Peter	Quanser Inc.
Wight, Derek	Quanser
Apkarian, Jacob	Quanser Consulting Inc.
11:40-12:10	WeA2.3
<i>Design of Tutorial Activities and Homework Assignments for a Large-Enrollment Introductory Course in Control Systems</i> , pp. 43-48.	

Eichler, Annika	Hamburg Univ. of Tech. Germany
Hoffmann, Christian	Hamburg Univ. of Tech.
Kautz, Christian	Hamburg Univ. of Tech.
Werner, Herbert	Hamburg Univ. of Tech.
12:00-12:20	WeA2.4
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Salt, Julian	Univ. Pol. de Valencia
Dormido, Sebastián	UNED
Cuenca, Angel	Tech. Univ. of Valencia
Palau, Francisco	Univ. Pol. de Valencia
12:20-12:40	WeA2.5
<i>An Interactive CAD Tool to Teach and Learn Nyquist Criterion</i> , pp. 55-60.	
Costa-Castelló, Ramon	Univ. Pol. de Catalunya (UPC)
Guzman, Jose Luis	Univ. of Almeria
Berenguel, Manuel	Univ. of Almeria
Dormido, Sebastián	UNED
12:40-13:00	WeA2.6
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Vachhani, Leena	Indian Inst. of Tech. Bombay
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<b>Recent Advances in Remote Labs for Control Education (Invited Session)</b>	
Chair: Casini, Marco	Univ. di Siena
Co-Chair: Dominguez Gonzalez, Manuel	Univ. de Leon
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Casini, Marco	Univ. di Siena
Garulli, Andrea	Univ. di Siena
Giannitrapani, Antonio	Univ. di Siena
Vicino, Antonio	Univ. di Siena
16:20-16:40	WeB1.2
<i>A Virtual and Remote Control Laboratory in Moodle: The Ball and Beam System (I)</i> , pp. 72-77.	
Guinaldo, Maria	UNED
de la Torre, Luis	Spanish Open Univ. (UNED)
Heradio, Ruben	Univ. Nacional de Educacion a Distancia
Dormido, Sebastián	UNED
16:40-17:00	WeB1.3
<i>Virtual and Remote Practices for Learning Control Topics with a 3DOF Quadrotor</i> , pp. 78-83.	
Besada-Portas, Eva	Univ. Complutense Madrid
Lopez-Orozco, Jose Antonio	Complutense Univ.
Aranda, Joaquin	Univ. Nacional de Educación a Distancia
de la Cruz, Jesús M	Complutense Univ.
17:00-17:20	WeB1.4
<i>Laboratories Over the Network: From Remote to Mobile (I)</i> , pp. 84-89.	
Papadopoulos, Alessandro Vittorio	Pol. di Milano, Dipartimento di Elettronica e Informazione
Leva, Alberto	Pol. di Milano
17:20-17:40	WeB1.5
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Dominguez Gonzalez, Manuel	Univ. de Leon
Fuertes, Juan J.	Univ. de Leon
Prada, Miguel Angel	Univ. de Leon
Alonso Castro, Serafín	Univ. de León
Morán Álvarez, Antonio	Univ. de Leon
Barrientos, Pablo	Inst. DE AUTOMATICA Y FABRICACIÓN DE LA Univ. DE LEON
17:40-18:00	WeB1.6
<i>A Complete Solution for Developing Remote Labs</i> , pp. 96-101.	
Mejias, Andres	Univ. of Huelva

Marquez, Marco A.  
Andújar, José Manuel  
Sanchez, Maria Reyes

Univ. of Huelva  
Univ. de Huelva  
Univ. of Huelva

<b>WeB2</b>		Portobello Building: Room B
<b>Teaching Aids for Control Engineering (II) (Regular Session)</b>		
Chair: Sulc, Bohumil		Czech Tech. Univ. in Prague
Co-Chair: Haugen, Finn		Telemark Univ. Coll.
16:00-16:20		WeB2.1
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Vrána, Stanislav		Czech Tech. Univ. in Prague
Sulc, Bohumil		Czech Tech. Univ. in Prague
16:20-16:40		WeB2.2
<i>A Revised View on Teaching Basic Process Control</i> , pp. 108-113.		
Haugen, Finn		Telemark Univ. Coll.
Wolden, Kjell Erik		Telemark Univ. Coll.
16:40-17:00		WeB2.3
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Vozák, Daniel		Slovak Univ. of Tech.
Ilka, Adrian		Slovak Univ. of Tech.
17:00-17:20		WeB2.4
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Holic, Ivan		Slovak Univ. of Tech. in Bratislava
Ilka, Adrian		Slovak Univ. of Tech.
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Fernandez, Daniel		Univ. of Costa Rica
Alfaro, Victor		Univ. of Costa Rica
Arrieta, Orlando		Univ. of Costa Rica
Vilanova, Ramon		Univ. Autònoma de Barcelona

**Technical Program for Thursday August 29, 2013**

<b>ThA1</b>		Portobello Building: Room A
<b>Open Educational Resources (Regular Session)</b>		
Chair: Wilson, David I.		Auckland Univ. of Tech.
Co-Chair: Golob, Marjan		Univ. of Maribor, Faculty of Electrical Engineeringand
10:30-10:50		ThA1.1
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Rossiter, Anthony		Univ. of Sheffield
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Chacón, Jesús		Univ. Nacional de Educación a Distancia
Sánchez Moreno, José		UNED
Visioli, Antonio		Univ. of Brescia
Dormido, Sebastián		UNED
11:10-11:30		ThA1.3
<i>From Chalk Talk to Tablet Talk: Pedagogies for Control Engineering</i> , pp. 144-149.		
Wilson, David I.		Auckland Univ. of Tech.
Maclaren, Peter		Auckland Univ. of Tech.
11:30-11:50		ThA1.4
<i>Development of Interactive Books for Control Education</i> , pp. 150-155.		
Gonzalez, Juan Carlos		Univ. of Almeria
Guzman, Jose Luis		Univ. of Almeria
Dormido, Sebastián		UNED
Berenguel, Manuel		Univ. of Almeria
11:50-12:10		ThA1.5
<i>Distributed Knowledge-Based Computer-Aided Control Education Environment</i> , pp. 156-161.		
Aguayo, Francisco José		Univ. de León
García, Isaías		Professor Assistant, Univ. of Leon
Benavides, Carmen		Univ. of Leon
Aláiz, Héctor		Univ. de León
Alonso, Angel		Univ. of Leon
Alija, José Manuel		Univ. de León
12:10-12:30		ThA1.6
<i>Web-Based Monitoring and Control of Industrial Processes Used for Control Education</i> , pp. 162-167.		
Golob, Marjan		Univ. of Maribor, Faculty of Electrical Engineeringand
Bratina, Božidar		Univ. of Maribor, Faculty of electrical engineering
<b>ThA2</b>		Portobello Building: Room B
<b>Robotics (Regular Session)</b>		
Chair: Mitchell, Richard		Univ. of Reading
Co-Chair: Vajk, Istvan		Budapest Univ. of Tech. and Ec.
10:30-10:50		ThA2.1
<i>The Cyber Challenge – a Robotics Project to Enthuse</i> , pp. 168-173.		
Minchinton, Paul		Univ. of Reading
Gould, Stephen		Univ. of Reading
Mitchell, Richard		Univ. of Reading
10:50-11:10		ThA2.2
<i>An Educational Software to Develop Robot Mapping and Localization Practices Using Visual Information</i> , pp. 174-179.		
Paya, Luis		Miguel Hernández Univ.
Amoros, Francisco		Miguel Hernandez Univ.
Fernandez, Lorenzo		Miguel Hernández Univ.
Reinoso, Oscar		Univ. Miguel Hernández
11:10-11:30		ThA2.3
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Burkodi, László Csaba		Budapest Univ. of Tech. and Ec.
Kiss, Tamás Gábor		Budapest Univ. of Tech. and Ec.

Varga, Dániel	Budapest Univ. of Tech. and Ec.
Vajk, Istvan	Budapest Univ. of Tech. and Ec.
Karkus, Péter	Budapest Univ. of Tech. and Ec.
11:30-11:50	ThA2.4
<i>The RoboAUT Robot Construction Contest in 2013</i> , pp. 186-191.	
Kiss, Tamás Gábor	Budapest Univ. of Tech. and Ec.
Burkodi, László Csaba	Budapest Univ. of Tech. and Ec.
Varga, Dániel	Budapest Univ. of Tech. and Ec.
Vajk, Istvan	Budapest Univ. of Tech. and Ec.
Karkus, Péter	Budapest Univ. of Tech. and Ec.
11:50-12:10	ThA2.5
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Shakouri, Payman	Kingston Univ.
Duran, Olga	Kingston Univ.
Ordys, Andrzej W.	Kingston Univ. London
Collier, Gordana	Kingston Univ.
12:10-12:30	ThA2.6
<i>Telerobotics for Education: A Marriage of Pedagogy and Technology Management</i> , pp. 198-202.	
Srinivasan, Lakshminarasimhan	Univ. of Würzburg
Schilling, Klaus	Univ. Wuerzburg
<b>ThB1</b>	Portobello Building: Room A
<b>Control Education Using Lab Equipment (I) (Regular Session)</b>	
Chair: Eastwood, Paul	Univ. of Sheffield
Co-Chair: Evertz, Lars	RWTH Aachen Univ.
14:30-14:50	ThB1.1
<i>Teaching Cascaded Controllers with a Fuel Cell Plant in a Hands-On Laboratory</i> , pp. 203-207.	
Evertz, Lars	RWTH Aachen Univ.
Kruening, Kai	RWTH Aachen Univ.
Epple, Ulrich	RWTH Aachen Univ.
14:50-15:10	ThB1.2
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Taylor, Ben P.	Univ. of Sheffield
Eastwood, Paul	Univ. of Sheffield
Jones, Bryn Ll.	Univ. of Sheffield
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Padula, Fabrizio	Univ. of Brescia
Visioli, Antonio	Univ. of Brescia
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Misgeld, Berno	RWTH Aachen Univ.
Pomprapa, Anake	RWTH Aachen Univ.
Leonhardt, Steffen	RWTH Aachen
15:50-16:10	ThB1.5
<i>A New Device Laboratory: Experimental Validation</i> , pp. 226-231.	
Pujol, Gisela	Escola Univ. d'Enginyeria Tecnica Industrial
Acho, Leonardo	EUETIB-Univ. Pol. of Catalunya
Napoles, Amelia	Univ. de Catalunya -BarcelonaTech
16:10-16:30	ThB1.6
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Heath, William Paul	Univ. of Manchester
Onel, Oliver	Univ. of Manchester
Green, Peter Michael	Univ. of Manchester
Lennox, Barry	Univ. of Manchester
Gai, Zhenyu	The Univ. of Hong Kong
He, Zhiwei	Univ. of Manchester





**Technical Program for Friday August 30, 2013**

<b>FrA1</b>		Portobello Building: Room A
<b>Control Education Using Lab Equipment (II) (Regular Session)</b>		
Chair: Huba, Mikulas		Slovak Univ. of Tech.
Co-Chair: Atanasijevic-Kunc, Maja		Univ. of Ljubljana
09:00-09:20		FrA1.1
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Carrasco, Joaquin		Univ. of Manchester
Heath, William Paul		Univ. of Manchester
Rodríguez Liñán, María del Carmen		Univ. of Manchester
Alli-Oke, Razak		Univ. of Manchester
Abdel Kerim, Omar A. R.		Univ. of Manchester
Rodriguez Gutierrez, Sergio		Univ. of Manchester
09:20-09:40		FrA1.2
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Barber, Ramón		Univ. Carlos III
Rodríguez Rosa, David		Univ. Carlos III de Madrid
Garrido, Santiago		Univ. Carlos III de Madrid
09:40-10:00		FrA1.3
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Barber, Ramón		Univ. Carlos III
DE LA HORRA KÖLLMER, MARIO		Univ. CARLOS III DE MADRID
Crespo, Jonathan		Univ. Carlos III de Madrid
10:00-10:20		FrA1.4
<i>Low-Cost Platforms Used in Control Education: An Educational Case Study</i> , pp. 256-261.		
Irigoyen, Eloy		Univ. of the Basque Country (UPV/EHU)
Larzabal, Ekaitz		Univ. of the Basque Country (UPV/EHU)
Priego, Rafael		Univ. of the Basque Country (UPV/EHU)
10:20-10:40		FrA1.5
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Huba, Mikulas		Slovak Univ. of Tech.
Malatinec, Tomáš		STU Bratislava
Huba, Tomáš		STU Bratislava
10:40-11:00		FrA1.6
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Atanasijevic-Kunc, Maja		Univ. of Ljubljana
Logar, Vito		Faculty of Electrical engineering, Univ. of Ljubljana
Papic, Marko		Univ. of Ljubljana, Faculty of Electrical Engineering
Bešter, Janez		Univ. of Ljubljana
Karba, Rihard		Univ. of Ljubljana
<b>FrA2</b>		Portobello Building: Room B
<b>University-Industry Cooperation in Control Engineering Education (Regular Session)</b>		
Chair: Komulainen, Tiina M.		Oslo and Akershus Univ. Coll.
Co-Chair: Love, Jonathan		Newcastle Univ.
09:00-09:20		FrA2.1
<i>Integrating Commercial Process Simulators into Engineering Courses</i> , pp. 274-279.		
Komulainen, Tiina M.		Oslo and Akershus Univ. Coll.
09:20-09:40		FrA2.2
<i>Teaching Competences in Control Education: The French Industrial Science Example</i> , pp. 280-285.		
RIOU, Hervé		LMT-Cachan
Sandou, Guillaume		SUPELEC
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<i>Virtual and Remote Laboratories for Industrial Automation E-Learning</i> , pp. 286-290.		
Caldas Pinto, João R		Tech. Univ. of Lisbon, Inst. Superior Tecnico
Sa da Costa, Jose		Tech. Univ. of Lisbon

10:20-11:00	FrA2.5
<i>Process Automation Academy*</i>	
Love, Jonathan	Newcastle Univ.
<b>FrB1</b>	Portobello Building: Room A
<b>Software in Control Education</b> (Regular Session)	
Chair: Gomez-Estern, Fabio	Univ. De Sevilla
Co-Chair: Mitchell, Richard	Univ. of Reading
13:30-13:50	FrB1.1
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Rossiter, Anthony	Univ. of Sheffield
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Sánchez Moreno, José	UNED
Dormido, Raquel	UNED
Duro, Natividad	Univ. Nacional De Educacion A Distancia (uned)
Fernández Sedano, Ignacio	Univ. of Almeria
Dormido, Sebastián	UNED
14:10-14:20	FrB1.3
<i>Improved MATLAB GUIs for Learning Frequency Response Methods</i> , pp. 303-308.	
Mitchell, Richard	Univ. of Reading
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Kosane Kalave, Eniko	Univ. of Debrecen
Bezi, Istvan	Budapest Univ. of Tech. and Ec.
Bars, Ruth	Budapest Univ. of Tech. and Ec.
14:50-15:10	FrB1.5
<i>Performance Portrait Method: A New CAD Tool</i> , pp. 315-320.	
Huba, Mikulas	Slovak Univ. of Tech.
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Sánchez del Pozo, Adolfo	Univ. of Seville
Escaño, Juan Manuel	Univ. of Seville
Muñoz de la Peña, David	Univ. de Sevilla
Gomez-Estern, Fabio	Univ. De Sevilla
<b>FrB2</b>	Portobello Building: Room B
<b>Virtual and Remote Labs</b> (Regular Session)	
Chair: Candelas Herias, Francisco Andres	Univ. of Alicante
Co-Chair: Kaluz, Martin	Slovak Univ. of Tech. in Bratislava, Slovakia
13:30-13:50	FrB2.1
<i>Design of Remote 3D Virtual Laboratory for Education on Control System Experimentation</i> , pp. 327-332.	
Liang, Yuxin	Harbin Inst. of Tech.
Liu, Guoping	Univ. of Glamorgan
13:50-14:10	FrB2.2
<i>Remote Laboratory for Learning in Control Engineering</i> , pp. 333-338.	
Popescu, Marian	Petroleum-Gas Univ. of Ploiesti
Paraschiv, Nicolae	Petroleum-Gas Univ. of Ploiesti
14:10-14:20	FrB2.3
<i>Practical Experiences on a Real Pumping System Emulated by a Hardware Model and Used As a Remote Laboratory</i> , pp. 339-344.	
Pomares, Jorge	Univ. of Alicante
Perea, Iván	Univ. of Alicante
Jara, Carlos Alberto	Univ. of Alicante
Candelas Herias, Francisco Andres	Univ. of Alicante
Torres, Fernando	Univ. of Alicante
14:20-14:50	FrB2.4

*Sharing Control Laboratories by Remote Laboratory Management System WebLab-Deusto*, pp. 345-350.

Kaluz, Martin	Slovak Univ. of Tech. in Bratislava, Slovakia
Orduna, Pablo	Univ. of Deusto
Garcia-Zubia, Javier	Univ. of Deusto
Fikar, Miroslav	Slovak Univ. of Tech. in Bratislava
Cirka, Lubos	Slovak Univ. of Tech. in Bratislava

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14:50-15:10 FrB2.5

*Remote Laboratory with an Electro-Pneumatic Classification Cell*, pp. 351-356.

Prada, Miguel Angel	Univ. de Leon
Dominguez Gonzalez, Manuel	Univ. de Leon
Fuertes, Juan J.	Univ. de Leon
Barrientos, Pablo	Inst. DE AUTOMATICA Y FABRICACIÓN DE LA Univ. DELEON
Del Canto Masa, Carlos Javier	Inst. de Automática y Fabricación (Univ. de León)
García de Prado, Sergio	Inst. de Automatica y Fabricacion de Leon

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15:10-15:30 FrB2.6

*Testing Bench for Remote Practical Training in Electric Machines*, pp. 357-362.

Sanchez, Maria Reyes	Univ. of Huelva
Andújar, José Manuel	Univ. de Huelva
Mejias, Andres	Univ. of Huelva
Marquez, Marco A.	Univ. of Huelva