

# **9th IFAC Symposium on Advances in Control Education 2012**

**Nizhny Novgorod, Russia  
19-21 June 2012**

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# Content List of 9th IFAC Symposium Advances in Control Education

## Technical Program for Tuesday June 19, 2012

|   |  |
|---|--|
| <b>TuPPA</b>  | Room A   |
| <b>120 Years of Lyapunov's Methods</b> (Plenary Session)  |  |
| Chair: Pasik-Duncan,<br>Bozena  | Univ. of Kansas.   |
| 10:00-11:00   | TuPPA  |
| <i>120 Years of Lyapunov's Methods</i>  |  |
| Stephen Boyd  | Stanford University, USA                                   |
| <b>Tu01A</b>  | Room A   |
| <b>History of Control</b> (Regular Session)   |  |
| Chair: Naidu, D. Subbaram   | Idaho State Univ.  |
| Co-Chair: Stepanov, O.A.  | Concern CSRI Elektropribor,<br>JSC                         |
| 11:30-11:50   | Tu01A.1  |
| <i>The Electronic Collection "Alexander Lyapunov's Life and Work"</i> , pp. 1-6.  |  |
| Pakshina, Natalia   | Arzamas Pol. Inst. of R. E.<br>Alekshev Nizhny Novgorod    |
| Emelianov, Mikhail  | Arzamas Pol. Inst. of R.E.<br>Alekshev Nizhny Novgorod S   |
| 11:50-12:10   | Tu01A.2  |
| <i>Academician V.M. Matrosov: Research and Teaching on Stability, Nonlinear Dynamics and Control in Aerospace Systems</i> , pp. 7-12. |  |
| Degtyarev, Gennady  | Tupolev Kazan State Tech. Univ.<br>Russia                  |
| Druzhynin, Eduard   | Inst. of System Dynamics and<br>Control Theory, SB of RAS  |
| Kozlov, Ravil   | Inst. of Systems Dynamics and<br>Control Theory, SB of RAS |
| Kuzmina, Lyudmila   | Tupolev Kazan State Tech.<br>Univ. (KSTU-KAI)              |
| Sirazetdinov, Talgat  | Kazan State Tech. Univ. named<br>after A.N. Tupolev, Russi |
| Somov, Yevgeny  | Samara State Tech. Univ.                                   |
| Vassilyev, Stanislav N.   | Trapeznikov Inst. of Control<br>Sciences RAS               |
| Zemlyakov, Alexander  | Tupolev Kazan State Tech. Univ.                            |
| 12:10-12:30   | Tu01A.3  |
| <i>A.M. Letov: Life, Scientific Research, International Activity and Teaching Operation</i> , pp. 13-17.                              |  |
| Kurdyukov, A.P.   | Russian Acad. of Sciences                                  |
| Letova, Tatyana   | Moscow Aviation Inst.                                      |
| Vassilyev, Stanislav N.   | Trapeznikov Inst. of Control<br>Sciences RAS               |
| 12:30-12:50   | Tu01A.4  |
| <i>The EECI-HYCON Graduate School on Control: Back on Ten Years of Doctoral Training</i> , pp. 18-22.                                 |  |
| Panteley, Elena V.  | CNRS   |
| Chaillet, Antoine   | EECI - Univ. Paris Sud - Sup lec                           |
| Lamnabhi-Lagarigue,<br>Françoise  | CNRS-EECI  |
| Gonçalves, Eugenie  | European Embedded Control<br>Inst. (EECI)                  |
| 12:50-13:10   | Tu01A.5  |
| <i>The Conference of Young Scientists "Navigation and</i>   |  |

*Motion Control" As a Means of Training Scientists*, pp. 23-27.

|                    |                                    |
|--------------------|------------------------------------|
| Stepanov, O.A.     | Concern CSRI Elektropribor,<br>JSC |
| Yashnikova, Olga   | Concern CSRI Elektropribor,<br>JSC |
| Taranovsky, Dmitry | Concern CSRI Elektropribor,<br>JSC |
| Krasnov, Anton     | Concern CSRI Elektropribor,<br>JSC |
| Kovalev, Andrey    | CSRI Elektropribor                 |
| Yulmetova, Olga    | Concern CSRI Elektropribor,<br>JSC |
| Yukhta, Pavel      | Concern CSRI Elektropribor,<br>JSC |
| Semenov, Ilya      | Concern CSRI Elektropribor,<br>JSC |

13:10-13:30 Tu01A.6

*Journey of Education in Control Systems from IIT (1965) to ISU (2012)*, pp. 28-33.

|                    |                   |
|--------------------|-------------------|
| Naidu, D. Subbaram | Idaho State Univ. |
|--------------------|-------------------|

**Tu01B** Room B  
**Mathematics and Mechanics in Control Education** (Regular Session)

|                           |   |
|---------------------------|---|
| Chair: Kumkov, Sergey I.  | Inst. of Mathematics and<br>Mechanics Ural Branch of RAS              |
| Co-Chair: Golikov, Alexey | Precision Mechanics and Control<br>Inst. RussianAcademyof<br>Sciences |

11:30-11:50 Tu01B.1

*Techniques for Helping Control Engineers Learn Mathematics*, pp. 34-38.

|                      |                    |
|----------------------|--------------------|
| Rossiter, J. Anthony | Univ. of Sheffield |
| Patel, Chetna        | Univ. of Sheffield |

11:50-12:10 Tu01B.2

*An Innovative Multimedia Learning Method As Applied to Theoretical Mechanics and Theory of Gyroscopes*, pp. 39-44.

|                     |  |
|---------------------|--|
| Golikov, Alexey     | Precision Mechanics and Control<br>Inst. RussianAcademyof Scie |
| Dzhashitov, Viktor  | Precision Mechanics and Control<br>Inst. Russian Acad. of Sc   |
| Pankratov, Vladimir | Precision Mechanics and Control<br>Inst. Russian Acad. of Sc   |

12:10-12:30 Tu01B.3

*Slow Integral Manifolds in Control and Graduate Education in Samara*, pp. 45-50.

|                   |  |
|-------------------|--|
| Osintsev, Mikhail | Korolev Samara State<br>Aerospace Univ. (SSAU) |
| Sobolev, Vladimir | Samara State Aerospace Univ.<br>(SSAU)         |

12:30-12:50 Tu01B.4

*Developing Methods and Computer Technologies for Learning, Identification and Optimization of Nonlinear Stochastic Systems*, pp. 51-56.

|                    |                                 |
|--------------------|---------------------------------|
| Rodnishev, Nikolay | Tupolev Kazan State Tech. Univ. |
| Novikova, Svetlana | Tupolev Kazan State Tech. Univ. |
| Denisov, Kirill    | Tupolev Kazan State Tech. Univ. |

12:50-13:10 Tu01B.5

*Some Models of Control with Fractional Brownian Motions*, pp. 57-59.

Duncan, Tyrone E. Univ. of Kansas  
Pasik-Duncan, Bozenna Univ. of Kansas

13:10-13:30 Tu01B.6

*Interval Analysis Methods in Lecture Course of Digital Procession of Information*, pp. 60-65.

Kumkov, Sergey I. Inst. of Mathematics and  
Mechanics Ural Branch of RAS

**Tu01C** Room C  
**Control Engineering Education** (Regular Session)

Chair: Dormido, Sebastián UNED  
Co-Chair: Kozáková, Alena Slovak Univ. of Tech. in  
Bratislava

11:30-11:50 Tu01C.1

*Interactive Tools to Learn Basic Concepts of Nonlinear Systems Linearization through a Case Study*, pp. 66-71.

Guzman, Jose Luis Univ. of Almeria  
Costa, Ramon Univ. Pol. De Catalunya  
Dormido, Sebastián UNED  
Berenguel, Manuel Univ. of Almeria

11:50-12:10 Tu01C.2

*Decentralized Robust Control of MIMO Systems: Quadruple Tank Case Study*, pp. 72-77.

Rosinova, Danica Slovak Univ. of Tech. in  
Bratislava  
Kozáková, Alena Slovak Univ. of Tech. in  
Bratislava

12:10-12:30 Tu01C.3

*State Space Control Design: An Interactive Tool for Control Education*, pp. 78-83.

Krasnansky, Robert Slovak Univ. of Tech. in  
Bratislava  
Kozáková, Alena Slovak Univ. of Tech. in  
Bratislava

12:30-12:50 Tu01C.4

*Robust Control Methods in the Master Programme Cybernetics*, pp. 84-89.

Vesely, Vojtech Slovak Univ. of Tech. in  
Bratislava  
Vozák, Daniel Slovak Univ. of Tech.

12:50-13:10 Tu01C.5

*Robust Decentralized Controller Design: Laboratory Project-Based Learning*, pp. 90-95.

Kozáková, Alena Slovak Univ. of Tech. in  
Bratislava  
Vesely, Vojtech Slovak Univ. of Tech. in  
Bratislava

13:10-13:30 Tu01C.6

*State Feedback Control Design for Multivariable Discrete Time Systems with Required Accuracy Via Mean-Square Criterion*, pp. 96-101.

Chestnov, V.N. Moscow Steel & Alloys Inst.  
Zatsepilova, Zhanna National Univ. of Science and  
Tech. «MISIS»

**Tu02A** Room A  
**LEGO Robots for Control Education** (Regular Session)

Chair: Bobtsov, Alexey Saint Petersburg National Res.  
Univ. of Information Tech.  
Mechanics and Optics

Co-Chair: Zamorano, Juan Univ. Pol. de Madrid

14:30-14:50 Tu02A.1

*Lego Mindstorms NXT for Students' Research Projects in Control Field*, pp. 102-106.

Kolyubin, Sergey Saint-  
PetersburgStateUniversityofInfor-  
mationTechnologiesMechani

Bobtsov, Alexey Saint Petersburg National Res.  
Univ. of Information Tec

Pyrkin, Anton Saint-Petersburg State Univ. of  
InformationTechnology, Mech

Kapitonov, Aleksandr Saint-Petersburg State Univ. of  
Information Tech. M

Shavetov, Sergei Saint-Petersburg state Univ. of  
informationtechnologies, me

Khovanskiy, Alexey St. Petersburg State Univ. of IT,  
Mechanics and Optics

Krasnov, Aleksandr Saint Petersburg National Res.  
Univ. ofInformation Tech.

Vlasov, Serge SPb NRU ITMO

Fes'kov, Alexey SPb NRU ITMO

14:50-15:10 Tu02A.2

*Control Approaches for Complicated Self-Unstable Plants with Applications for Two-Wheel Mobile Robot Motobot in Educational Purposes*, pp. 107-111.

Borgul, Alexandr National Res. Univ. of  
InformationTechnologies, Mecha-  
nic

Zimenko, Konstantin Saint Petersburg National Res.  
Univ. of Information Te

Bobtsov, Alexey Saint Petersburg National Res.  
Univ. of Information Tec

Pyrkin, Anton Saint-Petersburg State Univ. of  
InformationTechnology, Mech

15:10-15:30 Tu02A.3

*A Platform for Real-Time Control Education with LEGO MINDSTORMS*, pp. 112-117.

Bradley, Peter Tech. Univ. of Madrid

de la Puente, Juan Antonio Univ. Pol. de Madrid

Zamorano, Juan Univ. Pol. de Madrid

Brosnan, Daniel Tech. Univ. of Madrid

15:30-15:50 Tu02A.4

*Control Engineering at School: Learning by Examples*, pp. 118-123.

Filippov, Sergey St.Petersburg Phys&Math  
Lyceum #239

Fradkov, Alexander L. Russian Acad. of Sciences

15:50-16:10 Tu02A.5

*Low-Cost Robotic Set-Up for Pursuit Problems*, pp. 124-127.

Semakova, Anna Saint Petersburg State Univ.

Oblapenko, George Saint Petersburg State Univ.

Ovchinnikov, Kirill Saint Petersburg State Univ.

Trifonov, Alexander Saint Petersburg State Univ.

16:10-16:30 Tu02A.6

*LEGO NXT for Experimental Validation of Iterative Learning Control Schemes*, pp. 128-133.

Kamath, Anantha Ganesh Uppsala Univ.

Avula, Vishnuvardhan Uppsala Univ.

Zambrano, Darine Uppsala Univ.

| Tu02B  | Room B   |
|--|--|
| <b>Aerospace Control Education</b> (Regular Session)   |  |
| Chair: Barabanov, Andrey E.  | Saint Petersburg State Univ.                             |
| Co-Chair: Somov, Yevgeny   | Samara State Tech. Univ.                                 |
| 14:30-14:50  | Tu02B.1  |
| <i>Avionics Specialists Training in Tula State University</i> , pp. 134-137.   |  |
| Raspopov, Volodimir  | Tula State Univ.   |
| Gryazev, Mihail  | Tula State Univ.   |
| Kukhar, Volodimir  | Tula State Univ.   |
| 14:50-15:10  | Tu02B.2  |
| <i>Automated Control Systems of Small-Sized Unmanned Aerial Vehicles. Educational Aspect</i> , pp. 138-143.                    |  |
| Raspopov, Volodimir  | Tula State Univ.   |
| Ladonkin, Alexander  | Tula State Univ.   |
| Mashnin, Maxim   | Tula State Univ.   |
| Kukhar, Volodimir  | Tula State Univ.   |
| 15:10-15:30  | Tu02B.3  |
| <i>Testbed for Tracking System Design</i> , pp. 144-147.   |  |
| Barabanov, Andrey E.   | Saint Petersburg State Univ.                             |
| Romaev, Dmitry   | Navis, Saint Petersburg, Russia                          |
| 15:30-15:50  | Tu02B.4  |
| <i>Control and Identification of Helicopter</i> , pp. 148-150.   |  |
| Barabanov, Andrey E.   | Saint Petersburg State Univ.                             |
| Romaev, Dmitry   | Navis, Saint Petersburg, Russia                          |
| 15:50-16:10  | Tu02B.5  |
| <i>Quadrotors As Studying Platform</i> , pp. 151-153.  |  |
| Maltseva, Tatiana  | National Res. Univ. of Information Technologies, Mechnic |
| Labadin, Dmitry  | National Res. Univ. of Information Technologies, Mechnic |
| 16:10-16:30  | Tu02B.6  |
| <i>Computer Technologies for Optimization, Simulation and Animation of Observation Satellite Spatial Motion</i> , pp. 154-159. |  |
| Somov, Sergey  | Samara State Tech. Univ.                                 |
| Butyrin, Sergey  | Samara State Tech. Univ.                                 |
| Somova, Tatyana  | Samara State Tech. Univ.                                 |

| Tu02C  | Room C                               |
|--|--------------------------------------|
| <b>Virtual Laboratories</b> (Regular Session)  |                                      |
| Chair: Bars, Ruth  | Budapest Univ. of Tech. and Ec.      |
| Co-Chair: Candelas Herias, Francisco Andres  | Univ. of Alicante                    |
| 14:30-14:50  | Tu02C.1                              |
| <i>Synchronous Collaboration between Auto-Generated WebGL Applications and 3D Virtual Laboratories Created with Easy Java Simulations</i> , pp. 160-165. |                                      |
| Jara, Carlos Alberto   | Univ. of Alicante                    |
| Candelas, Francisco Andres   | Univ. of Alicante                    |
| Torres, Fernando   | Univ. of Alicante                    |
| Salzmann, Christophe   | Ec. Pol. Fédérale de Lausanne        |
| Gillet, Denis  | Ec. Pol. Fédérale de Lausanne (EPFL) |
| Esquembre, Francisco   | Professor, Ph. D                     |
| Dormido, Sebastián   | UNED                                 |

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|---|---|
| 14:50-15:10   | Tu02C.2                                       |
| <i>Virtual Laboratory on Nonlinear Control</i> , pp. 166-171.   |   |
| Tkachev, Sergey   | Bauman Moscow State Tech. Univ.               |
| Aldoshin, Denis   | Bauman Moscow State Tech. Univ.               |
| Golubev, Alexey   | Bauman Moscow State Tech. Univ.               |
| 15:10-15:30   | Tu02C.3                                       |
| <i>A Virtual Lab with Automatic Assessment for Nonlinear Controller Design Exercises</i> , pp. 172-176. |   |
| Sánchez Cazorla, Carlos   | Univ. de Sevilla                              |
| Gomez-Estern, Fabio   | Univ. De Sevilla                              |
| Muñoz de la Peña, David   | Univ. de Sevilla                              |
| 15:30-15:50   | Tu02C.4                                       |
| <i>From Virtual Lab to Virtual Development Lab</i> , pp. 177-182.                                       |   |
| Mikhaylov, Nikolay  | St. Petersburg State Univ. of Aerospace Inst. |
| Chernov, Dmitrii  | White Dwarf Ltd.                              |
| 15:50-16:10   | Tu02C.5                                       |
| <i>A New Framework to Develop Web-Based Interactive Tools for Control Education</i> , pp. 183-188.      |   |
| Gonzalez, Juan Carlos   | Univ. of Almeria                              |
| Guzman, Jose Luis   | Univ. of Almeria                              |
| Berenguel, Manuel   | Univ. of Almeria                              |
| Dormido, Sebastián  | UNED  |
| 16:10-16:30   | Tu02C.6                                       |
| <i>Widget-Based Approach for Remote Control Labs</i> , pp. 189-193.                                     |   |
| Bogdanov, Evgeny  | Ec. Pol. Federal de Lausanne                  |
| Salzmann, Christophe  | Ec. Pol. Fédérale de Lausanne                 |
| Gillet, Denis   | Ec. Pol. Fédérale de Lausanne (EPFL)          |

| Tu03A   | Room A  |
|---|---|
| <b>Laboratory Experiments</b> (Regular Session)   |   |
| Chair: Zakova, Katarina   | Slovak Univ. of Tech. in Bratislava   |
| Co-Chair: Tapak, Peter  | Slovak Univ. of Tech. in Bratislava, Faculty of Electrical Engineering and Information Technology |
| 17:00-17:20   | Tu03A.1   |
| <i>Design and Development of a Low Cost Rapid Control Prototyping System Applied to an Air Suspension System</i> , pp. 194-199. |   |
| Zajac, Michal   | HTW-Berlin  |
| Donath, Henning   | Univ. of Applied Science Berlin (HTW)   |
| Huebner, Ingo   | Univ. of Applied Science Berlin (HTW)   |
| Mende, Torsten  | Univ. of Applied Science Berlin (HTW)   |
| Schriefer, Michael  | Univ. of Applied Science Berlin (HTW)   |
| Heinrich, Frank   | Univ. of Applied Science Berlin (HTW)   |
| Berisch, Gabriel  | Univ. of Applied Science Berlin (HTW)   |
| Lipke, Tobias   | Univ. of Applied Science Berlin (HTW)   |
| Schulte, Horst  | Univ. of Applied Science Berlin   |

(HTW)  
17:20-17:40 Tu03A.2

*Integration of Inertial Measuring Unit Platform into MATLAB Simulink*, pp. 200-205.

|                 |   |
|-----------------|---|
| Palkovic, Lukas | Slovak Univ. of Tech. Faculty of Electrical Engineering |
| Chovanec, Lubos | Slovak Univ. of Tech. Faculty of Electrical Engineering |
| Rodina, Jozef   | Slovak Univ. of Tech. Faculty of Electrical Engineering |
| Hubinsky, Peter | Slovak Univ. of Tech. Faculty of Electrical Engineering |

17:40-18:00 Tu03A.3

*SciLab Based Remote Control of Experiments*, pp. 206-211.

|                  |                                     |
|------------------|-------------------------------------|
| Magyar, Zoltán   | Slovak Univ. of Tech.               |
| Zakova, Katarina | Slovak Univ. of Tech. in Bratislava |

18:00-18:20 Tu03A.4

*Control Systems Analysis and Design Labs with Educational Plants*, pp. 212-217.

|                      |                              |
|----------------------|------------------------------|
| Sotnikova, Margarita | Saint-Petersburg State Univ. |
| Zhabko, Natalia      | Saint-Petersburg State Univ. |
| Lepikhin, Timur      | Saint-Petersburg State Univ. |

18:20-18:40 Tu03A.5

*Nonlinear Control of Liquid Level*, pp. 218-223.

|               |  |
|---------------|--|
| Tapak, Peter  | Slovak Univ. of Tech. in Bratislava, Faculty of Electrical Engineering |
| Huba, Mikulas | Slovak Univ. of Tech.  |

18:40-19:00 Tu03A.6

*Vertical Rotor for the Implementation of Control Laws*, pp. 224-229.

|                |                             |
|----------------|-----------------------------|
| Sanchez, David | Univ. COMPLUTENSE DE MADRID |
|----------------|-----------------------------|

**Tu03B** Room B  
**Teaching Aids** (Regular Session)

|                             |  |
|-----------------------------|--|
| Chair: Kozak, Stefan        | Faculty of Electrical Engineering and Information Tech.                |
| Co-Chair: Pakshina, Natalia | Arzamas Pol. Inst. of R. E. Alekseev Nizhny Novgorod State Tech. Univ. |

17:00-17:20 Tu03B.1

*Multi-Level Automated System of Close Support of the Learning Process in Continuing Control Education in Industry*, pp. 230-234.

|                  |  |
|------------------|--|
| Melnikov, Sergey | Arzamas Pol. Inst. of R. E. Alekseev Nizhny Novgorod S |
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17:20-17:40 Tu03B.2

*Advances in Online Courses on Process Control*, pp. 235-240.

|                 |   |
|-----------------|---|
| Kaluz, Martin   | Slovak Univ. of Tech. in Bratislava, Slovakia |
| Cirka, Lubos    | Slovak Univ. of Tech. in Bratislava           |
| Fikar, Miroslav | Slovak Univ. of Tech. in Bratislava           |

17:40-18:00 Tu03B.3

*Creating User-Friendly Dialogue in Systems of Virtual Training*, pp. 241-245.

|                   |  |
|-------------------|--|
| Pakshina, Natalia | Arzamas Pol. Inst. of R. E. Alekseev Nizhny Novgorod |
|-------------------|--|

|                   |   |
|-------------------|---|
| Pravdina, Marina  | Arzamas Pol. Inst. of R.E. Alekseev Nizhny Novgorod S |
| Kivonogova, Maria | Arzamas Pol. Inst. of R.E. Alekseev Nizhny Novgorod S |

18:00-18:20 Tu03B.4

*Organization of Cyclic Training Process in E-Learning Tools*, pp. 246-251.

|                     |   |
|---------------------|---|
| Emelianova, Julia   | Arzamas Pol. Inst. of R.E. Alekseev Nizhny Novgorod S |
| Troickiy, Alexander | Arzamas Pol. Inst. of R.E. Alekseev Nizhny Novgorod S |
| Pakshina, Natalia   | Arzamas Pol. Inst. of R. E. Alekseev Nizhny Novgorod  |

18:20-18:40 Tu03B.5

*Teaching Aids for Modeling and Control of Hybrid Systems (CAMCHS)*, pp. 252-257.

|               |   |
|---------------|---|
| Stevek, Juraj | Slovak Univ. of Tech. Faculty of Informatics and Inform |
| Kozak, Stefan | Faculty of Electrical Engineering and Information Tech. |

18:40-19:00 Tu03B.6

*The PROFIBUS Protocol Observation*, pp. 258-263.

|               |                                     |
|---------------|-------------------------------------|
| Belai, Igor   | Slovak Univ. of Tech. in Bratislava |
| Drahoš, Peter | Slovak Univ. of Tech. in Bratislava |

**Tu03C** Room C  
**Virtual and Remote Laboratories** (Regular Session)

|                               |                  |
|-------------------------------|------------------|
| Chair: Berenguel, Manuel      | Univ. of Almeria |
| Co-Chair: Prada, Miguel Angel | Univ. de Leon    |

17:00-17:20 Tu03C.1

*Integrated Virtual and Remote Lab for Greenhouse Climate Control*, pp. 264-269.

|                           |                  |
|---------------------------|------------------|
| Rivas, Juan Luis          | Univ. of Almeria |
| Guzman, Jose Luis         | Univ. of Almeria |
| Rodríguez-Díaz, Francisco | Univ. of Almería |
| Berenguel, Manuel         | Univ. of Almeria |
| Dormido, Sebastián        | UNED             |

17:20-17:40 Tu03C.2

*Synchronous Collaboration with Virtual and Remote Labs in Moodle*, pp. 270-275.

|                                   |   |
|-----------------------------------|---|
| Jara, Carlos Alberto              | Univ. of Alicante                       |
| Heradio, Ruben                    | Univ. Nacional de Educacion a Distancia |
| de la Torre, Luis                 | Spanish Open Univ. (UNED)               |
| Sánchez Moreno, José              | UNED                                    |
| Dormido, Sebastián                | UNED                                    |
| Torres, Fernando                  | Univ. of Alicante                       |
| Candelas Herias, Francisco Andres | Univ. of Alicante                       |

17:40-18:00 Tu03C.3

*Enhancing Virtual and Remote Labs to Perform Automatic Evaluation*, pp. 276-281.

|                         |  |
|-------------------------|--|
| Farias, Gonzalo         | Pontificia Univ. Catolica de Valparaiso (PUCV) |
| Gomez-Estern, Fabio     | Univ. De Sevilla                               |
| de la Torre, Luis       | Spanish Open Univ. (UNED)                      |
| Muñoz de la Peña, David | Univ. de Sevilla                               |
| Sánchez Cazorla, Carlos | Univ. de Sevilla                               |

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Dormido, Sebastián UNED

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18:00-18:20 Tu03C.4

*Improving User Interaction in Remote Laboratories through HTML5/AJAX*, pp. 282-287.

Dominguez Gonzalez, Manuel Univ. de Leon

Prada, Miguel Angel Univ. de Leon

Morán Álvarez, Antonio Univ. de Leon

Alonso Castro, Serafín Univ. de León

Barrientos, Pablo Inst. DE AUTOMATICA Y FABRICACIÓN DE LA Univ. DELEON

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18:20-18:40 Tu03C.5

*Virtual and Remote Laboratory of a DC Motor*, pp. 288-293.

Fuertes, Juan J. Univ. de Leon

Alonso Castro, Serafín Univ. de León

Morán Álvarez, Antonio Univ. de Leon

Prada, Miguel Angel Univ. de Leon

García de Prado, Sergio Inst. de Automatica y Fabricacion de Leon

Del Canto Masa, Carlos Inst. de Automática y Fabricación (Univ. de León)

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18:40-19:00 Tu03C.6

*EasyJava Simulations Meets TwinCAT: Remote Real-Time Control Experiments Using Programmable Logic Controllers*, pp. 294-299.

Besada-Portas, Eva Univ. Complutense Madrid

Lopez-Orozco, Jose Antonio Complutense Univ.

de la Torre, Luis Spanish Open Univ. (UNED)

de la Cruz, Jesús M Complutense Univ.

**Technical Program for Wednesday June 20, 2012**

|   |  |
|---|--|
| <b>WePPA</b>  | Room A   |
| <b>Control at the Speed of Light: Setpoint Regulation of Gene Expression in the Living Cell</b> (Plenary Session) |  |
| Chair: Vicino, Antonio  | Univ. di Siena   |
| 09:00-10:00   | WePPA.1  |
| <i>Control at the Speed of Light: Setpoint Regulation of Gene Expression in the Living Cell</i>                   |  |
| Mustafa Khammash  | Swiss Federal Institute of Technology - Zurich (ETHZ)    |
| <b>WePaP</b>  | Room A   |
| <b>Rethinking control education in the modern world</b> (Panel Session)   |  |
| Moderator: Sebastián Dormido  | Vice-Chair IFAC Technical Committee on Control Education |
| 10:30-12:30   | WePaP  |
| <i>Rethinking control education in the modern world</i>   |  |

**Technical Program for Thursday June 21, 2012**

|   |                           |
|---|---------------------------|
| <b>Th PPA</b>   | Room A                    |
| <b>Motivation for Studying Basic Nonlinear and Adaptive Control Theory</b> (Plenary Session)  |                           |
| Chair: Fradkov, Alexander L.  | Russian Acad. of Sciences |
| 09:00-10:00   | ThPPA.                    |
| Motivation for Studying Basic Nonlinear and Adaptive Control Theory,<br>Alexey Bobtsov National Research University of Information Technologies, Mechanics & Optics (NRU ITMO), Saint Petersburg, Russia<br>Univ. of Almeria  |                           |
| <b>Th01A</b>  | Room A                    |
| <b>Postgraduate Education on Automatic Control in Aerospace</b> (Invited Session)   |                           |
| Chair: Somov, Yevgeny   | Samara State Tech. Univ.  |
| Co-Chair: Bertoni, Gianni   | Univ. of Bologna          |
| 10:30-10:50   | Th01A.1                   |
| <i>SpaceMaster: Master in Space Science and Technology As an International Interdisciplinary Educational Effort (I)</i> , pp. 300-305.<br>Schilling, Klaus Univ. Wuerzburg  |                           |
| 10:50-11:10   | Th01A.2                   |
| <i>Postgraduate Education on Fault Diagnosis and Control Reconfiguration in Aerospace (I)</i> , pp. 306-311.<br>Bertoni, Gianni Univ. of Bologna<br>Castaldi, Paolo Univ. of Bologna - Aerospace Engineering Faculty<br>Penati, Elisabetta Univ. of Bologna   |                           |
| 11:10-11:30   | Th01A.3                   |
| <i>Postgraduate Education and New Challenges on Stability and Adaptive-Robust Control in Aerospace (I)</i> , pp. 312-317.<br>Somov, Yevgeny Samara State Tech. Univ.<br>Siguerdidjane, Houria SUPELEC<br>Rutkovsky, Vladislav Yu. Inst. OF CONTROL SCIENCES   |                           |
| 11:30-11:50   | Th01A.4                   |
| <i>Educational Program "Navigation and Control in Space and on the Earth. Mathematical Methods and Algorithms" (I)</i> , pp. 318-323.<br>Golovan, Andrew Moscow State Lomonosov Univ.<br>Alexandrov, V. V. Moscow State Univ.<br>Bolotin, Yury Moscow State Univ.<br>Lemak, Stepan Stepanovich Moscow State Univ.<br>Popelensky, Michael Lomonosov Moscow State Univ. |                           |
| 11:50-12:10   | Th01A.5                   |
| <i>Model Problems of Aircraft Guidance in Education Program on Optimal Control and Differential Games (I)</i> , pp. 324-329.<br>Patsko, Valerii Inst. of Math&Mech<br>Ganebny, Sergey Inst. of Mathematics and Mechanics UrB RAS<br>Fedotov, Andrey Inst. of Mathematics and Mechanics<br>Kumkov, Sergey Inst. of Mathematics and Mechanics UrB RAS                   |                           |
| 12:10-12:30   | Th01A.6                   |
| <i>Postgraduate Education in Nonlinear Dynamical Systems and Automatic Control in Aerospace (I)</i> , pp. 330-335.<br>Tkachev, Sergey Bauman Moscow State Tech. Univ.   |                           |

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| Golubev, Alexey   | Bauman Moscow State Tech. Univ.  |
| Krishchenko, Alexander  | Bauman Moscow State Tech. Univ.  |
| <b>Th01B</b>  | Room B   |
| <b>Robotics in Education</b> (Regular Session)  |  |
| Chair: Casini, Marco  | Univ. di Siena   |
| Co-Chair: Bobtsov, Alexey   | Saint Petersburg National Res. Univ. of Information Tech. Mechanics and Optics |
| 10:30-10:50   | Th01B.1  |
| <i>Management of a Lecture of Robot Contest for Many Students</i> , pp. 336-341.<br>Makino, Koji Tokyo Univ. of Tech.<br>Ohyama, Yasuhiro Tokyo Univ. of Tech.<br>Matsuo, Yoshiki Tokyo Univ. of Tech.  |  |
| 10:50-11:10   | Th01B.2  |
| <i>Educational Aspects of Designing Robot for Eurobot Contest</i> , pp. 342-347.<br>Varga, Dániel Budapest Univ. of Tech. and Ec.<br>Csorba, Kristof Budapest Univ. of Tech. and Ec.<br>Szalóki, Dávid BME<br>Beck, Zoltán BME<br>Tevesz, Gábor Budapest Univ. of Tech. and Ec. (BME)   |  |
| 11:10-11:30   | Th01B.3  |
| <i>Mechatronic and Robotic Setups for Modern Control Theory Workshops</i> , pp. 348-353.<br>Kolyubin, Sergey Saint-Petersburg State University of Information Technologies and Mechanics<br>Bobtsov, Alexey Saint Petersburg National Res. Univ. of Information Tech.<br>Pyrkin, Anton Saint-Petersburg State Univ. of Information Technology, Mech<br>Borgul, Alexandr National Res. Univ. of Information Technologies, Mechanical<br>Zimenko, Konstantin Saint Petersburg National Res. Univ. of Information Tech.<br>Rabysh, Evgeny Saint-Petersburg State Univ. of Information Technologies and Mechanics |  |
| 11:30-11:50   | Th01B.4  |
| <i>A Remote Lab for Multi-Robot Experiments with Virtual Obstacles</i> , pp. 354-359.<br>Casini, Marco Univ. di Siena<br>Garulli, Andrea Univ. di Siena<br>Giannitrapani, Antonio Univ. di Siena<br>Vicino, Antonio Univ. di Siena  |  |
| 11:50-12:10   | Th01B.5  |
| <i>The RoboNUT Autonomous Mobile Robot Construction Contest</i> , pp. 360-365.<br>Csorba, Kristof Budapest Univ. of Tech. and Ec.<br>Varga, Dániel Budapest Univ. of Tech. and Ec.<br>Tevesz, Gábor Budapest Univ. of Tech. and Ec. (BME)<br>Vajk, Istvan Budapest Univ. of Tech. and Ec.   |  |
| 12:10-12:30   | Th01B.6  |
| <i>A Matlab-Based Framework for the Remote Control of a</i>   |  |

*6DOF Robotic Arm for Education and Research in Control Theory*, pp. 366-371.

Ruderman, Michael Tech. Univ. Dortmund  
 Hoffmann, Frank Univ. of Dortmund  
 Bertram, Torsten Tech. Univ. Dortmund

**Th01C** Room C  
**Industrial Hardware for Education** (Regular Session)

Chair: Dittmar, Rainer West Coast Univ. of Applied Sciences  
 Co-Chair: Sarabia, Daniel Univ. of Valladolid

10:30-10:50 Th01C.1

*A Hands-On Laboratory on Industrial Hardware, Process Control and Advanced Automation*, pp. 372-377.

Krausser, Tina RWTH Aachen Univ.  
 Evertz, Lars RWTH Aachen Univ.  
 Epple, Ulrich RWTH Aachen Univ.

10:50-11:10 Th01C.2

*Use of an Industrial Distributed Control System in Conjunction with Matlab/Simulink for Process Control Education*, pp. 378-383.

Dittmar, Rainer West Coast Univ. of Applied Sciences

11:10-11:30 Th01C.3

*A Laboratory Experiment for Teaching Bioprocess Control -- Part 2: Bioprocess Design, Modelling, Simulation, and Fermentation Execution*, pp. 384-389.

Knapp, Ruben Mannheim Univ. of Applied Sciences  
 Rabe, Jan-Hinrich Hochschule Mannheim - Univ. of Applied Sciences

Kirchgßner, Sebastian Mannheim Univ. of Applied Sciences

Storhas, Winfried Mannheim Univ. Inst. of Tech. Microbiology

Wolf, Martin Univ. of Mannheim

11:30-11:50 Th01C.4

*Laboratory Plant of a Gas Distribution Network*, pp. 390-395.

Navia, Daniel Univ. of Valladolid  
 Martí, Martínez, Rubén UVA  
 Sarabia, Daniel Univ. of Valladolid  
 de Prada, Cesar Univ. of Valladolid

11:50-12:10 Th01C.5

*Design and Implementation of a Water-Based Emulator of Manufacturing Processes*, pp. 396-401.

Starkov, Konstantin K. Eindhoven Univ. of Tech.  
 Kamp, Hans Wafer Based Solutions B.V.  
 Pogromsky, A. Yu. Eindhoven Univ. of Tech.  
 Adan, I.J.B.F. Eindhoven Univ. of Tech.

12:10-12:30 Th01C.6

*A Laboratory Experiment for Teaching Bioprocess Control -- Part 1: Hardware Setting*, pp. 402-407.

Wolf, Martin Univ. of Mannheim  
 Ninov, Vasil Heidelberg Univ.  
 Babel, Heiko HS Mannheim  
 Hütter, Kimmo Univ. of Applied Sciences, Mannheim  
 Staudt, Ralph Univ. of Heidelberg  
 Storhas, Winfried Mannheim Univ. Inst. of Tech.

Microbiology

Badreddin, Essam Heidelberg Univ.

**Th02A** Room A  
**New Education Technologies and Applications** (Regular Session)

Chair: Novikov, Dmitry Inst. of Control Sciences of Russian Acad. of Sciences

Co-Chair: Dourado, Antonio Univ. of Coimbra

13:30-13:50 Th02A.1

*Collective Learning-By-Doing*, pp. 408-412.

Novikov, Dmitry Inst. of Control Sciences of Russian Acad. of Sciences

13:50-14:10 Th02A.2

*Systems and Control for Biomedical Engineering Students*, pp. 413-417.

Dourado, Antonio Univ. of Coimbra  
 Cardoso, Alberto Univ. of Coimbra  
 Henriques, Jorge Univ. of Coimbra  
 Teixeira, César Univ. of Coimbra

14:10-14:30 Th02A.3

*Cloud Computing for Education in State Technical University of Nizhny Novgorod*, pp. 418-420.

Dmitriev, Sergey State Tech. Univ. of Nizhny Novgorod

Kononov, Alexander State Tech. Univ. of Nizhny Novgorod

Shiriaev, Mikhail State Tech. Univ. of Nizhny Novgorod

Malozemov, Sergey State Tech. Univ. of Nizhny Novgorod

14:30-14:50 Th02A.4

*Applied Innovative Projects As an Incentive of the Educational Process*, pp. 421-424.

Syreschikov, Vladimir Nizgorodsky Radio Tech. Coll.

14:50-15:10 Th02A.5

*Control Engineering Education with Help of Model-Based Program Tools for Robotic Construction Sets*, pp. 425-429.

Luchin, Roman Saint-Petersburg State Univ.

15:10-15:30 Th02A.6

*Educational Cybernetical Construction Set for Schools and Universities*, pp. 430-435.

Terekhov, Andrey Saint-Petersburg State Univ.  
 Luchin, Roman Saint-Petersburg State Univ.  
 Filippov, Sergey St.Petersburg Phys&Math Lyceum #239

**Th02B** Room B  
**Simple Controllers in Education** (Regular Session)

Chair: Rossiter, J. Anthony Univ. of Sheffield

Co-Chair: Vrána, Stanislav Czech Tech. Univ. in Prague, Faculty of Mechanical Engineering

13:30-13:50 Th02B.1

*Introducing PI to Chemical Engineers*, pp. 436-441.

Rossiter, J. Anthony Univ. of Sheffield

13:50-14:10 Th02B.2

*Robust Pid Controller Design for Coupled-Tank Process Using Labreg Software*, pp. 442-447.

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| Holic, Ivan  | Slovak Univ. of Tech. in Bratislava                    |
| Vesely, Vojtech  | Slovak Univ. of Tech. in Bratislava                    |
| 14:10-14:30  | Th02B.3  |
| <i>Educational Issues of PI-PID Controllers</i> , pp. 448-453.   |  |
| Yurkevich, Valery D.   | Novosibirsk State Tech. Univ.                          |
| Naidu, D. Subbaram   | Idaho State Univ.                                      |
| 14:30-14:50  | Th02B.4  |
| <i>Commonly Untaught Information Concerning Practical Use of Tuning Procedures in Control</i> , pp. 454-459. |  |
| Sulc, Bohumil  | Czech Tech. Univ. in Prague                            |
| Vr na, Stanislav   | Czech Tech. Univ. in Prague, Faculty of Mechanical Eng |
| 14:50-15:10  | Th02B.5  |
| <i>Comparing Approaches to Constrained Design of Integrating Controllers</i> , pp. 460-465.                  |  |
| Huba, Mikulas  | Slovak Univ. of Tech.                                  |
| Tapak, Peter   | Slovak Univ. of Tech. in Bratislava, Faculty ofElectri |

| Th02C  | Room C  |
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| <b>LMI in Control Education</b> (Regular Session)  |   |
| Chair: Balandin, Dmitry V.   | Res. Inst. for Appl. Math & Cyber.                                |
| Co-Chair: Antonovskaya, Olga G.  | Nizhny Novgorod State Univ. of Architecture and Civil Engineering |
| 13:30-13:50  | Th02C.1   |
| <i>LMI Based Time-Invariant Observers and Controllers in <math>H_{\infty}</math> Problems with Transients</i> , pp. 466-471. |   |
| Balandin, Dmitry V.  | Res. Inst. for Appl. Math & Cyber.                                |
| Kogan, Mark M.   | Architecture And Civil Engineering Univ.                          |
| Krivdina, Larisa N.  | Architecture and Civil Engineering Univ. of Nizhny Novgorod       |
| 13:50-14:10  | Th02C.2   |
| <i>An Experience of Using LMI Technique in Student Projects</i> , pp. 472-477.   |   |
| Pakshin, Pavel   | Arzamas Pol. Inst. of NSTU  |
| Emelianova, Julia  | Arzamas Pol. Inst. of NSTU  |
| Mazurov, Alexander   | Arzamas Pol. Inst. of NSTU  |
| 14:10-14:30  | Th02C.3   |
| <i>Speed Gradient Energy and Sampled-Data Control of Cart-Pendulum System</i> , pp. 478-483.                                 |   |
| Seifullaev, Ruslan   | Saint-Petersburg State Univ.                                      |
| 14:30-14:50  | Th02C.4   |
| <i>On Quadratic Lyapunov Function for Applied Dynamic Problems</i> , pp. 484-486.  |   |
| Antonovskaya, Olga G.  | Nizhny Novgorod State Univ. of Architecture and Civil Engin       |
| Goryunov, Vladimir I.  | Nizhny Novgorod State Univ.                                       |