



The 11th International Multi-Conference on Society, Cybernetics and Informatics

July 8 - 11, 2017 – Orlando, Florida, USA

PROCEEDINGS

(Post-Conference Edition)

Edited by:

Nagib Callaos

José Vicente Carrasquero

Belkis Sánchez

Andrés Tremante

Friedrich Welsch



Organized by

International Institute of Informatics and Systemics

Member of the International Federation for Systems Research (IFSR)

COPYRIGHT

Copyright and Reprint Permission: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy for private use. Instructors are permitted to photocopy, for private use, isolated articles for non-commercial classroom use without fee. For other copies, reprint, or republication permission, write to IIIS Copyright Manager, 13750 West Colonial Dr Suite 350 – 408, Winter Garden, Florida 34787, U.S.A. All rights reserved. Copyright 2017. © by the International Institute of Informatics and Systemics.

The papers of this book comprise the proceedings of the conference mentioned on the title and the cover page. They reflect the authors' opinions and, with the purpose of timely disseminations, are published as presented and without change. Their inclusion in these proceedings does not necessarily constitute endorsement by the editors.

ISBN: 978-1-941763-65-0 (Post-Conference)

The 11th International Multi-Conference on Society, Cybernetics and Informatics: IMSCI 2017

HONORARY PRESIDENT

William Lesso (1931-2015)



GENERAL CHAIRS

Nagib Callaos

Andrés Tremante

ORGANIZING COMMITTEE CHAIRS

Ángel Oropeza

José Vicente Carrasquero

PROGRAM COMMITTEE

Chairs:

Freddy Malpica (Venezuela)

Friedrich Welsch (Venezuela)

Abe, Jair Minoro	Paulista University	Brazil
Angelelli, Lee A.	IBM US Federal	USA
Arbez, Gilbert	University of Ottawa	Canada
Chang, Wen-Kui	Tunghai University	Taiwan
Cost, Richard	Johns Hopkins University	USA
Dubyak, Jeannette M.	Argosy University Atlanta	USA
Florescu, Gabriela C.	National Institute for R&D in Informatics	Romania
Ho, Sophia Shi-Huei	University of Taipei	Taiwan
Landu-Adams, Victoria	Argosy University Atlanta	USA
Lappas, Georgios	Technological Educational Institution of Western Macedonia	Greece
Ledesma Tan, Nemia	University of Negros Occidental-Recoletos	Philippines
Loffredo, Donald	University of Houston-Victoria	USA
Martínez-Álvarez, Manuel	National Polytechnic Institute	Mexico
Maymir-Ducharme, Fred A.	IBM US Federal	USA
Métioui, Abdeljalil	Université du Québec a Montréal	Canada
Mills, Melissa J.	Mills Consulting	USA
Nakajima, Hidehiro	Nagoya University	Japan
Orantes-Jiménez, Sandra D.	National Polytechnic Institute	Mexico
Peoples, Bruce E.	Université Paris 8	France
Royo, Sonia	University of Zaragoza	Spain
Siebold, Jeanine	Martin Luther King Jr. Magnet High School	USA
Stock, Wolfgang G.	Heinrich Heine University Düsseldorf	Germany
Sulema, Yevgeniya S.	National Technical University of Ukraine	Ukraine
Tavakkoli, Alireza	University of Houston-Victoria	USA
Trudel, Louis	University of Ottawa	Canada
Yavich, Roman	Ariel University	Israel
Zaretsky, Esther	Academic College for Education Givat Washington	Israel
Zavala-Galindo, Alejandro	National Polytechnic Institute	Mexico

ADDITIONAL REVIEWERS

Abar, Celina	Pontifical Catholic University of Sao Paulo	Brazil
Abd-Allah, Saber	Beni Suef University	Egypt
Abdel Hafez, Hoda	Suez Canal University	Egypt
Abdel Razek, Mohammed	King Abdulaziz university	Saudi Arabia
Abdel-Qader, Ikhlās	Western Michigan University	USA
Amaral, Luis	University of Minho	Portugal
Beer, Martin	Sheffield Hallam University	UK
Bouza-Herrera, Carlos	University of Havana	Cuba
Narciso		
Caldararu, Florin	Research Laboratory for Environmental Monitoring and Semiconductor Sensor	Romania
Canalda, Philippe	University of Franche-Comté	France
Caridade, Cristina	Coimbra Institute of Engineering	Portugal
Carrasquero, José Vicente	Simon Bolivar University	Venezuela
Carrió-Pastor, María Luisa	Polytechnic University of Valencia	Spain
Černý, Michal	Masaryk University	Czech Republic
Chau, Kwok-Wing	Hong Kong Polytechnic University	Hong Kong
Chen, Chau-Kuang	Meharry Medical College	USA
Choubisa, Rajneesh	Birla Institute of Technology	India
Cisneros-Cohernour, Edith	Autonomous University of Yucatan	Mexico
Cost, Richard	Johns Hopkins University Applied Physics Laboratory	USA
Cubukcu, Feryal	Dokuz Eylul University	Turkey
Diallo, Anthony	Sahara Media Group Ltd	Tanzania
Drikker, Alexander	St. Petersburg State University	Russian Federation
Elías Hardy, Lidia Lauren	Higher Institute of Technologies and Applied Sciences	Cuba
Encabo, Eduardo	University of Murcia	Spain
Faasen, Marinda	Moonstone Business School	South Africa
Fillion, Gerard	University of Moncton	Canada
Florescu, Gabriela	National Institute for R&D in Informatics	Romania
Fúster-Sabater, Amparo	Spanish Council for Scientific Research	Spain
Gedviliene, Genute	Vytautas Magnus University	Lithuania
Gundu, Srinivasa Rao	Dravidian University	India
Hammam, Mahmoud	Helwan University	Egypt
Hass, Douglas A.	Image Stream	USA
Hendel, Russell Jay	Towson University	USA
Holifield, David	University of Wales Institute Cardiff	UK
Iovan, Stefan	Romanian Railway IT Company	Romania
Jaakkola, Maarit	Nordicom, University of Gothenburg	Sweden
Katila, Sanda	Kent State University, School of Visual Communication Design	USA

Kent, Bill	Keiser University	USA
Kim, E-Jae	LG Electronics Institute of Technology	South Korea
Korovin, Iakov	Southern Federal University	Russian Federation
Lasmanis, Aivars	Baltic Alliance for Innovation	Latvia
Law, Rob	Hong Kong Polytechnic University	Hong Kong
Lygo-Baker, Simon	King's College London	UK
Mahanti, Prabhat	University of New Brunswick	Canada
Manganelli, Joe	xplr Design, Ilc Clemson	USA
Martínez, Liliana Inés	National University of Central Buenos Aires	Argentina
Mihaita, Niculae	Bucharest Academy of Economic Studies	Romania
Mitchell, Charles	Grambling State University	USA
Mohamed, Jedra	University in Rabat	Morocco
Monney Paiva, Joao	Polytechnic of Viseu	Portugal
Moustafa Abdel-Azeim,	Arab Academy for Science and Technology	Egypt
Mostafa Ali		
Ndunagu, Juliana	National Open University of Nigeria	Nigeria
Nugraheni, Cecilia E.	Parahyangan Catholic University	Indonesia
O'Nuallain, Caoimhin	Digital Enterprise Research Institute	Ireland
Opfer, Neil	University of Nevada	USA
Paideya, Vino	University of KwaZulu Natal	South Africa
Pester, Andreas	Carinthia Tech Institute	Austria
Petit, Frédéric	École Polytechnique de Montréal	USA
Prodan, Augustin	Iuliu Hatieganu University	Romania
Riihentausta, Juhani	University of Joensuu	Finland
Sala, Nicoletta	University of Italian Switzerland Largo Bernasconi	Italy
Sanz-González, José L.	Polytechnic University of Madrid	Spain
Savva, Andreas	University of Nicosia	Cyprus
Shing, Tenqchen	ChungHwa Telecom Labs	Taiwan
Silveira, Michelle	Federal University of Rio Grande do Norte	Brazil
Sulema, Yevgeniya	National Technical University of Ukraine	Ukraine
Thammakoranonta,	National Institute of Development Administration	Thailand
Nithinant		
Thirunarayanan, M. O.	Florida International University	USA
Tobos, Valentina	Lawrence Technological University	USA
Ulovec, Andreas	University of Vienna	Austria
Varughese, Joe	Northern Alberta Institute of Technology	Canada
Vázquez-Álvarez, Graciela	National Polytechnic Institute	Mexico
Vintere, Anna	Latvia University of Agriculture	Latvia
Wang, Ching-Huang	National Formosa University	Taiwan
Wang, Yi-Hsien	Chinese Culture University	Taiwan
Wortley, David	Gamification and Enabling Technologies Strategic Solutions	UK
Wu, Chu-Chu	Georgia Southwestern State University	USA
Xia, Shunren	Zhejiang University	China
Yildirim, Ali	Middle East Technical University	Turkey
Zainon Hamzah, Zaitul	Putra Malaysia University	Malaysia
Azma		

Zogla, Irena

University of Latvia

Latvia

ADDITIONAL REVIEWERS FOR THE NON-BLIND REVIEWING

Acevedo-Mosqueda, María-Elena	SEPI ESIME Zacatenco - National Polytechnic Institute	Mexico
Aguilar-Jáuregui, María-Elena	Computing Research Center of the National Polytechnic Institute	Mexico
Ahmad, Mubariq	Conservation Strategy Find	Indonesia
Alfaro, César	Universidad Rey Juan Carlos	Spain
Blanks, Brooke	Radford University	USA
Brugnach, Marcela	University of Twente	Netherlands
Callejo Perez, David	Saginaw Valley State University	USA
Can, Ozgu	Ege University	Turkey
Cebi, Yalcin	Dokuz Eylul University	Turkey
Chaamwe, Nchimunya	Copperbelt University	Zambia
Chen, Jung-Cheng Robin	National Chengchi University	Taiwan
Cosgrove, Debbie	Elmhurst College	USA
Debono, Carl J.	University of Malta	Malta
Dobronravin, Nikolai	St. Petersburg State University	Russian Federation
Faasen, Marinda	Moonstone Business School	South Africa
Gómez, Javier	Universidad Rey Juan Carlos	Spain
Granichin, Oleg	St. Petersburg State University	Russian Federation
Isabirye, Naomi	University of Fort Hare	South Africa
Karaosmanoğlu, Defne	Kadir Has University	Turkey
Karreman, Joyce	University of Twente	Netherlands
Kipp, Katherine	University of North Georgia	USA
Lehr, Dirk	Leuphana Universität Lüneburg	Germany
López Molina, Guadalupe	Universidad Iberoamericana	Mexico
Mitchell, Charles	Grambling State University	USA
Özcanhan, Mehmet Hilal	Dokuz Eylul University	Turkey
Özçetin, Burak	Kadir Has University	Turkey
Peng, Yen-Chun	Takming University	Taiwan
Romagnoli, Alex	Monmouth University	USA
Sekido, Fuyuhiko	Dokkyo University	Japan
Soedomo, Sudarsono	Bogor Agricultural University	Indonesia
Stokes, Jennifer	The University of South Australia	Australia
Swanson, Peter	Georgia state University	USA
Taylor, Carol	Georgetown University	USA
Unluturk, Mehmet Suleyman	Yaşar University	Turkey
Uzunoğlu, Sarphan	Kadir Has University	Turkey
Van Der Wal, Merel	Radboud University	Netherlands
Žibala, Dace	Rīga Stradiņš University	Latvia

Special Track on Politics and Information Systems, Technologies and Applications: PISTA 2017
in the context of
The 11th International Multi-Conference on Society, Cybernetics and Informatics: IMSCI 2017



HONORARY PRESIDENT OF PAST CONFERENCES

Freddy Malpica

GENERAL CHAIRS

Nagib Callaos (IMSCI)

Andrés Tremante (IMSCI)

PROGRAM COMMITTEE

Chair(s): Angel Oropeza (Venezuela)
 José Vicente Carrasquero (Venezuela)

Branham, David	University of Houston-Downtown	USA
Flammia, Madelyn	University of Central Florida	USA
Hendel, Russell J.	Towson University	USA
Lappas, Georgios	Technological Educational Institution of Western Macedonia	Greece
Targamadze, Vilija	Vilnius University	Lithuania
Yasinsac, Alec	University of South Alabama	USA

ADDITIONAL REVIEWERS

Barada, Hassan	Khalifa University of Science and Technology	United Arab Emirates
Cooper, Christopher	Western Carolina University	USA
Diallo, Anthony	Sahara Media Group	Tanzania
Hidasi, Judit	Budapesti Business School	Hungary
Ho, Wai-Chung	Hong Kong Baptist University	Hong Kong
Jiménez, Elsi	Central University of Venezuela	Venezuela
Li, Zhan	Xiamen University	China
Mambrey, Peter	University of Duisburg-Essen	Germany
Scott Cost, Richard	Johns Hopkins University Applied Physics Laboratory	USA
Targamadze, Vilija	Vilnius University	Lithuania

ADDITIONAL REVIEWERS FOR THE NON-BLIND REVIEWING

Huang, Tong-Yi	National Cheng-Chi University	Taiwan
Marinescu, Valentina	University of Bucharest	Romania
Marinov, Mario	South-West University "Neofit Rilski"	Bulgaria
Salman, Salman	Alquds University	Palestine

Sootla, Georg Tallinn University
Vulfovich, Revekka North-West Institute of RANEPa

Estonia
Russian Federation



PROGRAM COMMITTEE

Chairs: Ángel Oropeza (Venezuela)
Friedrich Welsch (Venezuela)
José Vicente Carrasquero (Venezuela)

Amos, Christopher N.	The University of West Florida	USA
Ash, George	Jefferson County ESC	USA
Boonyopakorn, Jaemjan	Rajamangala University of Technology Suvarnabhumi	Thailand
Bradford, Chelsey	Valparaiso University	USA
Brown, Henrietta	University of South Alabama	USA
Budnik, Mark M.	Valparaiso University	USA
Cavkaytar, Atilla	Anadolu University	Turkey
Creel, Amanda T.	University of South Alabama	USA
Cumbie, Barry	University of Southern Mississippi	USA
Daiki, Tennó	Eötvös Loránd University	Hungary
Dearman, Catherine	University of South Alabama	USA
Fernández, Trinidad	Technical University of Madrid	Spain
Fuchs, Kevin	Karlsruhe University of Applied Sciences	Germany
Fuentes, José-María	Technical University of Madrid	Spain
Hartmann, Mutfried	Karlsruhe University of Education	Germany
Henkel, Maria	Heinrich-Heine Universität	Germany
Henning, Peter A.	Karlsruhe University of Applied Sciences	Germany
Hilzensauer, Marlene	University of Klagenfurt	Austria
Hrkač, Ana	Kindergarten M. Sachs- Zagreb	Croatia
Hsu, Mark	University of Waterloo	Canada
King, Matthew	Valparaiso University	USA
Klosowski, Piotr	Silesian University of Technology	Poland
Lešin, Gordana	Kindergarten M. Sachs- Zagreb	Croatia
Mason, Sharon	Rochester Institute of Technology	USA
Métoui, Abdeljalil	Université du Québec à Montréal	Canada
Mezghani, Neila	Télé-Université	Canada
Mitrofanova, Ksenia A.	Ural State Medical University	Russian Federation
O'Sullivan, Jill Anne	Farmingdale State College	USA
Petit, Frédéric	Argonne National Laboratory	USA
Ramírez, Álvaro	Technical University of Madrid	Spain
Rosener, Bill	Northeastern State University	USA
Sanger, Patrick	Alvin Community College	USA
Schmidlin, Karin	University of Waterloo	Canada
Singh, Harwinder	Guru Nanak Dev Engineering College	India
Soeiro, Alfredo	University of Porto	Portugal
Sparkes, Douglas	University of Waterloo	Canada
Styron, Jennifer L.	University of South Alabama	USA
Styron, Jr., Ronald A.	University of South Alabama	USA
Sulema, Yevgeniya	National Technical University of Ukraine	Ukraine

Takahashi, Kaoru	Tokyo University of Science	Japan
Tepeš, Krunoslav	City Office for Transport- Zagreb	Croatia
Trudel, Louis	Ottawa University	Canada
Vaida, Mircea-Florin	Technical University of Cluj-Napoca	Romania
Vangeyte, J.	Institute for Agricultural and Fisheries Research	Belgium
Whitworth, Sheila	University of South Alabama	USA
Wieckert, Sarah	Technical University of Dortmund	Germany
Williams van Rooij, Shahron	George Mason University	USA
Woodside, Joseph M.	Stetson University	USA
Xeni, Elena	University of Cyprus	Cyprus
Zainon Hamzah, Zaitul Azma	Putra Malaysia University	Malaysia
Zaretsky, Esther	Academic College for Education Givat Washington	Israel
Zsakó, László	Eötvös Loránd University	Hungary



ADDITIONAL REVIEWERS

Abar, Celina	Pontifical Catholic University of Sao Paulo	Brazil
Abubakar, Ahmed	United Arab Emirates University	United Arab Emirates
Abuhejleh, Ahmad	University of Wisconsin River Falls	USA
Alba-Flores, Rocio	Georgia Southern University	USA
Aldana Segura, Waleska	Galileo University	Guatemala
Alvarado Moore, Karla	University of Central Florida	USA
Andreopoulou, Zacharoula	Aristotle University of Thessaloniki	Greece
Ariton, Viorel	Danubius University	Romania
Ash, George	Franciscan University	USA
Ayuga, Francisco	Technical University of Madrid	Spain
Baker, John	Johns Hopkins University	USA
Balicki, Jerzy Marian	Warsaw University of Technology	Poland
Balzano, Emilio	Università degli Studi di Napoli Federico II	Italy
Baudin, Veronique	Laboratory for Analysis and Architecture of Systems	France
Baumeister, Alexander	Saarland University	Germany
Baysal, Ugur	Hacettepe University	Turkey
Berge, Zane	University of Maryland	USA
Bidarra, José	Universidade Aberta	Portugal
Blankenship, Rebecca	Florida Agricultural and Mechanical University	USA
Bohemia, Erik	Northumbria University	UK
Bolboacă, Sorana D.	Iuliu Hatieganu University of Medicine and Pharmacy Cluj-Napoca	Romania
Branzila, Marius	Gheorghe Asachi Technical University of Iași	Romania
Breczko, Teodor	University of Bilystok	Poland
Brodnik, Andrej Andy	University of Primorska	Slovenia
Budnik, Mark M.	Valparaiso University	USA
Caldararu, Florin	Research Laboratory for Environmental Monitoring and Semiconductor Sensors	Romania
Caner, Mustafa	Akdeniz University	Turkey
Castaneda, Sandra	Autonomous University of Mexico	Mexico
Cayer, Joseph	Arizona State University	USA
Cerny, Michal	Masaryk University	Czech Republic
Chan, Chiu-Shui	Iowa State University	USA
Chan, Kan Kan	University of Macau	Macau
Chau, K. W.	Hong Kong Polytechnic University	Hong Kong
Chekour, Adam	University of Cincinnati	USA
Chen, Chau-Kuang	Meharry Medical College	USA

Comi, Giorgio	Swiss Federal Institute for Vocational Education and Training	Switzerland
Coppola, Jean	Pace University	USA
Costa Leite, Manuel	Lusophone University of Humanities and Technologies	Portugal
Cotfas, Petru Adrian	Transilvania University of Brasov	Romania
Cubukcu, Feryal	Dokuz Eylul University	Turkey
Da Silva, Andre	Federal Institute of São Paulo	Brazil
DeBaillie, Catherine	Trinity College of Nursing and Health Sciences	USA
Del Valle, María	University of Concepcion	Chile
Deng, Hepu	Royal Melbourne Institute of Technology University	Australia
Dhend, Mangal	AISSMS College of Engineering, Pune 1	India
Dingu-Kyrklund, Elena	Stockholm University	Sweden
Dosi, Vasiliki	University of Ioannina	Greece
Dotter, Franz	University of Klagenfurt	Austria
Du Plessis, Jacques	University of Wisconsin Milwaukee	USA
Duse, Carmen Sonia	Lucian Blaga University	Romania
Duse, Dan Maniu	Lucian Blaga University	Romania
Edwards-Henry, Anna	University of the West Indies	Trinidad and Tobago
Elías Hardy, Lidia Lauren	Higher Institute of Technologies and Applied Sciences	Cuba
Encabo, Eduardo	University of Murcia	Spain
Federici, Stefano	University of Perugia	Italy
Florescu, Gabriela	Imperial Chemical Industries	Romania
Frosch-Wilke, Dirk	University of Applied Sciences Kiel	Germany
Fulgueira, Sandra Magdalena	Universidad Nacional de Rosario	Argentina
Furda, Mark	Franciscan University of Steubenville	USA
Fúster-Sabater, Amparo	Institute of Physical and Information Technologies	Spain
Gacnik, Bonita	Mount Marty College	USA
García, Ana-Isabel	Polytechnic University of Madrid	Spain
García-Otero, Singli	Virginia State University	USA
Gavrilova, Tatiana	Saint Petersburg State University	Russian Federation
Gedvilienė, Genute	Vytautas Magnus University	Lithuania
Giampapa, Joseph	Carnegie Mellon University	USA
Goldberg, Robert	City University of New York	USA
González Jiménez, Antonio José	University of Almería	Spain
Gossman, Peter	Manchester Metropolitan University	UK
Gulbahar, Yasemin	Baskent University	Turkey
Hammam, Mahmoud	Helwan University	Egypt
Hellstern, Gerd-Michael	University Kassel	Germany
Hendel, Russell Jay	Towson University	USA
Herrera, Oriel	Temuco Catholic University	Chile
Holifield, David	University of Wales Institute Cardiff	UK
Hou, Jianjun	Peking University	China
Hsu, Donald	Dominican College of Blauvelt	USA
Ikeguchi, Cecilia	Tsukuba Women's University	Japan
Imbalzano, Giovanni	M.P.I. (Maker/Retired Professor)	Italy

Izydorczyk, Jacek	Silesian University of Technology	Poland
Janota, Ales	University of Žilina	Slovakia
Jong, BinShyan	Chung Yuan Christian University	Taiwan
Juárez-Ramírez, Reyes	Autonomous University of Baja California	Mexico
Kalwinsky, Bob	Middle Tennessee State University	USA
Kaur, Kiran	University of Malaya	Malaysia
Kikkas, Kaido	Tallinn University	Estonia
Kirova, Snezana	Goce Delcev University	Macedonia
Klett, Mitchell	Northern Michigan University	USA
Kolev, Emil	Bulgarian Academy of Sciences	Bulgaria
Koleza, Eugenia	University of Ioannina	Greece
Kor, Ah Lian	University of Leeds	UK
Kostadinov, Kostadin	Bulgarian Academy of Sciences	Bulgaria
Kouroupetroglou, Georgios	University of Athens	Greece
Kropid, Wendy	University of Wisconsin Superior	USA
Kundu, Anirban	West Bengal University of Technology	India
La Russa, Gaetano	University of Joensuu	Finland
Larruskain, Dunix Marene	University of the Basque Country	Spain
Lasmanis, Aivars	University of Latvia	Latvia
Law, Rob	Hong Kong Polytechnic University	Hong Kong
Leng, Ho Keat	Nanyang Technological University	Singapore
Lygo-Baker, Simon	King's College London	UK
Macianskiene, Nemira	Vytautas Magnus University	Lithuania
Maheshwari, Shikha	Jaipur Engineering College and Research Centre	India
Mainguenaud, Michel	Institut National des Sciences Appliquées	France
Maldonado, Calixto	Managerial University Siglio 21	Argentina
Marchisio, Susana	National University of Rosario	Argentina
Martínez, Liliana Inés	National University of Central Buenos Aires	Argentina
Metrolho, Jose	Polytechnic Institute of Castelo Branco	Portugal
Michelini, Marisa	University of Udine	Italy
Moch, Peggy	Valdosta State University	USA
Mohd Amin, Indah	MARA University of Technology	Malaysia
Molina, Silvia	Technical University of Madrid	Spain
Monney Paiva, Joao	Institute Polytechnic of Viseu	Portugal
Mullins, Michael	University of Aalborg	Denmark
Musto, Daniela	National Research Council of Italy	Italy
Nagraj, Guruprasad	New Horizon College of Engineering	India
Najafi, Bijan	Swiss Federal Institute of Technology-Lausanne	Switzerland
Nedic, Zorica	University of South Australia	Australia
Nooreen, Noordin	Universiti Putra Malaysia	Malaysia
Nugraheni, Cecilia Esti	Parahyangan Catholic University	Indonesia
Olatokun, Wole	University of Ibadan	Nigeria
Orsitto, Fulvio S.	California State University, Chico	USA
Panke, Stefanie	Knowledge Media Research Center	Germany
Peña Lang, Maria Begoña	University of the Basque Country	Spain
Peré, Nancy	University of the Republic	Uruguay
Pereira, Claudia Teresa	National University of Central Buenos Aires	Argentina
Pessoa, Fernando	Federal University of Rio de Janeiro	Brazil
Poobrasert, Onintra	National Electronics and Computer Technology Center	Thailand

Post, Paul	The Ohio State University	USA
Potorac, Alin Dan	University of Suceava	Romania
Potter, Marcia	Ministry of Education	British Virgin Islands
Quintanar, Daniel	City of Tucson Water Department - Tucson Water	USA
Rahouma, Kamel	Minia University	Egypt
Rajamony, Bhuvanesh	University Malaysia Perlis	Malaysia
Renés Arellano, Paula	University of Cantabria	Spain
Rensleigh, Chris	University of Johannesburg	South Africa
Reyes-Méndez, Jorge Joel	Metropolitan Autonomous University	Mexico
Riihenta, Juhani	University of Oulu	Finland
Ritter, Arthur	Stevens Institute of Technology	USA
Roderval, Marcelino	Federal University of Santa Catarina	Brazil
Rodi, Anthony	University of Pittsburgh	USA
Romagni, Susana	Metropolitan University	Venezuela
Rudd, Lauren	Middle Tennessee State University	USA
Rutkowski, Jerzy	Silesian University of Technology	Poland
Sadeghi Beniss, Aram Reza	Semnan University	Iran
Sanz González, José L.	Polytechnic University of Madrid	Spain
Sasaki, Hitoshi	Takushoku University	Japan
Serpa, Sandro	University of the Azores	Portugal
Silber, Kevin	University of Derby	UK
Smart, Fiona	Edinburgh Napier University	UK
Smith, Stella	Georgia Gwinnett College	USA
Snow, Mary	Embry-Riddle Aeronautical University	USA
Soltes, Dusan	Comenius University in Bratislava	Slovakia
Stojanov, Stanimir	University of Plovdiv	Bulgaria
Styron, Jr., Ronald A.	University of Southern Mississippi	USA
Su, Te-Jen	National Kaohsiung University of Applied Sciences	Taiwan
Sulema, Yevgeniya	National Technical University of Ukraine	Ukraine
Suranauwarat, Sukanya	National Institute of Development Administration	Thailand
Suviniitty, Jaana	Aalto University	Finland
Tan, Ying	Peking University	China
Taylor, Stephen	University of Sussex	UK
Thirunarayanan, M. O.	Florida International University	USA
Tobos, Valentina	Lawrence Technological University	USA
Torrisi-Steele, Geraldine	Griffith University	Australia
Tse, Kaho	The Education University of Hong Kong	Hong Kong
Tsinakos, Avgoustos	University of Macedonia	Greece
Turner, Sherri	Virginia Tech [retired]	USA
Tuzun, Hakan	Hacettepe University	Turkey
Ulovec, Andreas	University of Vienna	Austria
Vallejo Gutiérrez, José R.	Guanajuato University	Mexico
Varughese, Joe	Northern Alberta Institute of Technology	Canada
Vintere, Anna	Latvia University of Agriculture	Latvia
Wang, Ching-Huang	National Formosa University	Taiwan
Wang, Hongmei	Northern Kentucky University	USA
Wang, Jau-Shyong	Shu Te University	Taiwan
Wang, Zhigang	Fort Valley State University	USA
Weeden, Elissa	Rochester Institute of Technology	USA

Whatley, Janice	University of Salford	UK
Whitworth, Jerry	Texas Woman's University	USA
Wielki, Janusz	Opole University of Technology	Poland
Williams van Rooij, Shahron	George Mason University	USA
Wolfinger, Bernd E.	University of Hamburg	Germany
Wu, Chu-Chu	Georgia Southwestern State University	USA
Wu, Tung-Xiung (Sean)	Shih Hsin University	Taiwan
Xie, Haiyan	Illinois State University	USA
Yagcioglu, Ozlem	Dokuz Eylul University	Turkey
Yazici, Ali	Atilim University	Turkey
Yildirim, Ali	Middle East Technical University	Turkey
Zainon Hamzah, Zaitul Azma	Universiti Putra Malaysia	Malaysia
Zayan, Mohamed	Nilesat Company	Egypt
Zhang, Yuanzhong	Miami-Dade College	USA
Zhao, Xiaoguang	Institute of Automation Chinese Academy of Sciences	China



ADDITIONAL REVIEWERS FOR THE NON-BLIND REVIEWING

Aranha, Edison	Federal Institute of Santa Catarina	Brazil
Ash, George	Franciscan University	USA
Baiutti, Mattia	University of Udine	Italy
Balicki, Jerzy Marian	Warsaw University of Technology	Poland
Basim, Swamy	Central Connecticut State University	USA
Benner, Ayse	Ryerson University	Canada
Bernsteiner, Reinhard	Management Center Innsbruck	Austria
Bettencourt, Teresa	Universidade de Aveiro	Portugal
Cayer, Joseph	Arizona State University	USA
Chabalala, Dunisani Thomas	University of Johannesburg	South Africa
Chen, Xinjia	Northwestern State University	USA
Chou, Pao-Nan	National University of Tainan	Taiwan
Debus, Kolja	German Institute for Adult Education, Leibniz Centre for Lifelong Learning	Germany
Duse, Dan Maniu	Lucian Blaga University	Romania
El-Shazly, D. Mohamed	Ain-Shams University	Egypt
Erden, Mustafa Suphi	Heriot Watt University	UK
Espeland, Magne	Haugesund University College	Norway
Famiyeh, Samuel	Ghana Institute of Management and Public Administration	Ghana
Feuerlicht, George	University of Technology- Sydney	Australia
Fisher, Yael	Achva Academic College	Israel
Fudge, Anthea	University of South Australia	Australia
Garcia-Milà, Mercè	University of Barcelona	Spain
Garcia-Ottera, Singli	Virginia State University	USA
Goh, Wendy	Columbia University	Singapore
Han, Sangkil	Dankook University	South Korea
Hashimi, Imad	Jordan University of Science and Technology	Jordan
Helyer, Richard	University of Bristol	UK
Hill, Richard	University of Derby	UK
Ho, Hsuan-Fu	National Chiayi University	Taiwan
Hsu, Donald	Dominican College of Blauvelt	USA
Jannin, Pierre	INSERM Rennes/Université Rennes 1	France
Kang, Poong Ja	University of Guam	Guam
Keele, Rondo	Northwestern State University	USA
Krach, R. Michael	Towson University	USA
Labib, Wafa	Prince Sultan University	Saudi Arabia
Le, Qiang	Hampton University	USA
Leon Ariza, Henry Humberto	Universidad de La Sabana	Colombia

López, Jorge	University of Texas at El Paso	USA
Mahmood, Sajjad	King Fahd University of Petroleum and Minerals	Saudi Arabia
Maitland, Kathy	Birmingham City University	UK
Marrone, Dan	Farmingdale State College	USA
Moyer, Todd	Towson University	USA
Mujawamariya, Donatille	University of Ottawa	Canada
Natta, Herbert	University of Rome Tor Vergata	Italy
Novik, Andrej	SCIO	Czech Republic
Ogata, Hiroaki	Kyushu University	Japan
Onema, Jean-Marie Kileshye	WATERNET	Zimbabwe
Orentlicher, Meira	Touro College	USA
Orsitto, Fulvio S.	California State University, Chico	USA
Packmohr, Sven	Malmö University	Sweden
Poobrasert, Onintra	National Electronics and Computer Technology Center	Thailand
Qi, Yi	Texas Southern University	USA
Rajabion, Lila	University of South Florida	USA
Roy, Goutam	Rajshahi University	Bangladesh
Schlosser, Charles	Nova Southeastern University	USA
Schmitt, Karl	Valparaiso University	USA
Smart, Fiona	Edinburgh Napier University	UK
Stoicovy, Catherine	University of Guam	Guam
Torrissi-Steele, Geraldine	Griffith University	Australia
Tougaw, Doug	Valparaiso University	USA
Twinomurinzi, Hossana	University of South Africa	South Africa
Vacek, Vaclav	Czech Technical University	Czech Republic
Ventresca, Marc	Saïd Business School	UK
Wang, Hongmei	Northern Kentucky University	USA
Xiao, Liangliang	Frostburg State University	USA
Xu, Guobin	Frostburg State University	USA
Yagcioglu, Ozlem	Dokuz Eylul University	Turkey
Zea-Robles, Aura Catalina	Saint Thomas University	Colombia
Zhang, Lei	University of Maryland Eastern Shore	USA

The 15th International Conference on Education and Information Systems, Technologies and Applications: EISTA 2017
in the context of
The 11th International Multi-Conference on Society, Cybernetics and Informatics: IMSCI 2017



Honorary President

Freddy Malpica

Program Committee Chairs

Ángel Oropeza

Friedrich Welsch

José Vicente Carrasquero

General Chair

Nagib Callaos

Organizing Committee Chairs

Andrés Tremante

Belkis Sánchez

Conferences Program Manager / Hardcopy Proceedings Production Chair

María Sánchez

Technical Consultant on Computing Systems / CD Proceedings Production Chair

Juan Manuel Pineda

Operational Assistant

Marcela Briceño

Special Track on Social and Organizational Informatics and Cybernetics: SOIC 2017
in the context of
The 11th International Multi-Conference on Society, Cybernetics and Informatics: IMSCI 2017



HONORARY PRESIDENT OF PAST CONFERENCES

Freddy Malpica

GENERAL CHAIR

José Vicente Carrasquero

PROGRAM COMMITTEE

Chair(s): Friedrich Welsch (Venezuela)
Ángel Oropeza (Venezuela)

Cortés Zurita, Judith	Popular Autonomous University of Puebla	Mexico
Cost, Richard	Johns Hopkins University	USA
Florescu, Gabriela C.	National Institute for R&D in Informatics	Romania
Iovan, Stefan	Romanian Railway	Romania
Sala, Nicoletta	University of Lugano	Italy
Sulema, Yevgeniya S.	National Technical University of Ukraine	Ukraine

ADDITIONAL REVIEWERS

Amaral, Luis	University of Minho	Portugal
Andreopoulou, Zacharoula	Aristotle University of Thessaloniki	Greece
Fúster-Sabater, Amparo	Institute of Physical and Information Technologies	Spain
Khechine, Hager	Laval University	Canada
Kurtulus, Sema	Istanbul University	Turkey
Serpa, Sandro	University of the Azores	Portugal
Wang, Yi-Hsien	Yuanpei University	Taiwan

ADDITIONAL REVIEWERS FOR THE NON-BLIND REVIEWING

Karpov, Alexander	National Research University Higher School of Economics	Russian Federation
Khechine, Hager	Laval University	Canada
Lasmanis, Aivars	University of Latvia	Latvia



Number of Papers Included in these Proceedings per Country
(The country of the first author was the one taken into account for these statistics)

Country	# Papers	%
TOTAL	43	100.00
United States	16	37.21
Canada	2	4.65
Germany	2	4.65
Mexico	2	4.65
Russian Federation	2	4.65
South Africa	2	4.65
Australia	1	2.33
Bangladesh	1	2.33
Brazil	1	2.33
Bulgaria	1	2.33
Colombia	1	2.33
Cyprus	1	2.33
Czech Republic	1	2.33
France	1	2.33
Greece	1	2.33
Guam	1	2.33
Indonesia	1	2.33
Japan	1	2.33
Latvia	1	2.33
Peru	1	2.33
South Korea	1	2.33
Taiwan	1	2.33
Turkey	1	2.33

Foreword

Informatics and Cybernetics (communication and control) are having an increasing impact on societies and in the globalization process that is integrating them. Societies are trying to regulate this impact, and adapt it to their respective cultural infra-structures. Societies and cultures are in reciprocal co-adaptations with Information and Communication Technologies. Synergic relationships might emerge in this co-adaptation process by means of positive and negative feedback loops, as well as feedforward ones. This would make the whole larger than the sum of its parts, generating emergent properties in the parts involved as well as in the whole coming forth. The academic, private, and public sectors are integrating their activities; multi-disciplinary groups and inter-disciplinary teams are being formed, and collaborative research and development projects are being organized in order to facilitate and adequately orient the design and implementation of the feedback and the feedforward loops, and potentially generating synergic relationships. This phenomenon persuaded the Organizing Committee to organize The 11th International Multi-Conference on Society, Cybernetics and Informatics (IMSCI 2017) in a multi-disciplinary context along with other collocated events. Consequently, participants may focus on one discipline, while allowing them the possibility of attending conferences from other disciplines. This systemic approach stimulates cross-fertilization among different disciplines, inspiring scholars, originating new hypothesis, supporting production of innovations and generating analogical thinking.

IMSCI 2017 was organized and sponsored by the International Institute of Informatics and Systemics (IIIS, www.iiis.org), member of the International Federation of Systems Research (IFSR). The IIIS is a **multi-disciplinary organization for inter-disciplinary communication and integration**, which includes about 4000 members. Consequently, a main purpose of the IIIS is to foster knowledge integration processes, interdisciplinary communication, and integration of academic activities. Based on 1) the transdisciplinarity of the systemic approach and its emphasis on *relationships* and *integrating* processes, and 2) the multi-disciplinary support of cybernetics' and informatics' concepts, notions, theories, technologies, and tools, the IIIS has been organizing multi-disciplinary conferences as a platform for fostering inter-disciplinary communication and knowledge integration processes.

Multi-disciplinary conferences are organized by the IIIS as support for *both intra- and inter-disciplinary* communication. Processes of intra-disciplinary communication are mainly achieved via traditional paper presentations in corresponding disciplines, while conversational sessions, regarding trans- and inter-disciplinary topics, are among the means used for inter-disciplinary communication. Intra- and inter-disciplinary communications might generate *co-regulative cybernetic loops*, via negative feedback, and *synergic* relationships, via positive feedback loops, in which both kinds of communications could increase their respective effectiveness. Figure 1 shows at least two cybernetic loops if intra- and inter-disciplinary are adequately related. A necessary condition for the effectiveness of Inter-disciplinary communication is an adequate level of *variety* regarding the participating disciplines. *Analogical thinking and learning processes* of disciplinarians depend on it; which in turn are potential sources of the creative tension required for cross-fertilization among disciplines and the generations of new hypothesis. An extended presentation regarding this issue can be found at www.iiis.org/MainPurpose.

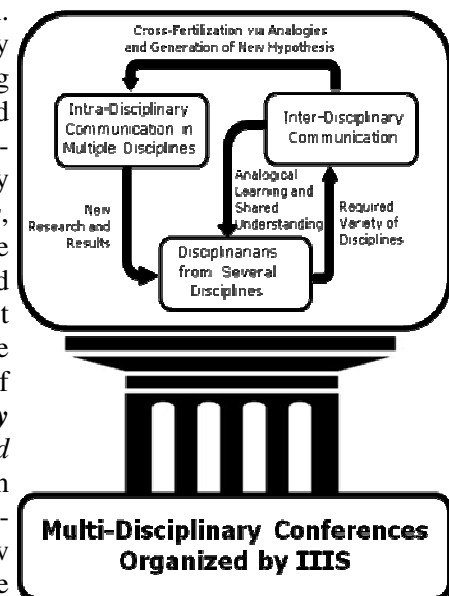


Figure 1

One of the main purposes of IMSCI 2017 is to bring together academics, professionals, and managers from the private and the public sectors, in order to share ideas, results of research, and innovative services or products, in a multi-disciplinary and multi-sector forum.

Educational technologies, socio-economic organizations, and socio-political processes are essential domains among those involved in the evolving co-adaptation and co-transformation between societies and cultures on the one hand, and between informatics and cybernetics (communication and control) on the other hand. Consequently, the main conference in the context of the IMSCI 2017 Multi-Conference is the 15th International Conference on Education and Information Systems, Technologies and Applications: EISTA 2017

The relationship between education/training and Information and Communication Technologies (ICT) is quickly intensifying and sometimes appears in unexpected forms and in combination with original ideas, innovative tools, methodologies, and synergies. Accordingly, the primary purpose of EISTA 2017 has been to bring together researchers and practitioners from both areas together to support the emerging bridge between education/training and the ICT communities.

In the context of EISTA 2017, practitioners and consultants were invited to present case studies and innovative solutions. Corporations were invited to present education/training information systems and software-based solutions. Teachers and professors were invited to present case studies, specifically developed information systems, and innovative ideas and designs. Educational scientists and technologists were invited to present research or position papers on the impact and the future possibilities of ICT in educational systems, training processes, and methodologies. Managers of educational organizations and training consultants were invited to present problems that might be solved by ICT or solutions that might be improved by different approaches and designs in ICT.

EISTA 2017 provides a forum for the presentation of solutions and problems in the application of ICT in the fields of education/training. Authors of the papers included in the proceedings provided diverse answers to the following questions:

- What is the impact of ICT in education and training?
- How are ICTs affecting and improving education and training? What networks and models are emerging?
- How are universities, schools, corporations and other educational/training organizations making use of ICT?
- What electronic tools are there to facilitate e-learning, distance education and co-operative training?

On behalf of the Organizing Committees, I extend our heartfelt thanks to:

1. The 93 members of the Program Committees (including the events and the special tracks organized in the context of IMSCI 2017) from 28 countries;
2. The 287 additional reviewers, from 60 countries, for their *double-blind peer reviews*; and
3. The 115 reviewers, from 42 countries, for their efforts in making the **non-blind peer reviews**. (Some reviewers supported both: non-blind and double-blind reviewing for different

A total of 856 reviews made by 402 reviewers (who made at least one review), from 72 countries, contributed to the quality achieved in IMSCI 2017. This means an average of 8.15

reviews per submission (105 submissions were received). *Each registered author had access, via the conference web site, to the reviews that recommended the acceptance of their respective submissions.* Each registered author could also get information about: 1) the average of the reviewers evaluations according to 8 criteria, and the average of a global evaluation of his/her submission; and 2) the comments and the constructive feedback made by the reviewers, who recommended the acceptance of his/her submission, so the author would be able to improve the final version of the paper.

In the organizational process of IMSCI 2017, about 105 articles were submitted. These pre-conference proceedings include about 43 papers, from 23 countries that were accepted for presentation (52 countries taking into account the presentations in collocated events). We extend our thanks to co-chairs special tracks organizers for their support. The submissions were reviewed as carefully as time permitted; it is expected that most of them will appear in a more polished and complete form in scientific journals.

This information about IMSCI 2017 is summarized in the following table, along with the other collocated conferences:

Conference	# of submissions received	# of reviewers that made at least one review	# of reviews made	Average of reviews per reviewer	Average of reviews per submission	# of papers included in the proceedings	% of submissions included in the proceedings
WMSCI 2017	240	805	1253	1.56	5.22	142	59.17%
IMSCI 2017	105	402	856	2.13	8.15	43	40.95%
WMSCI & IMSCI 2017	345	1207	2109	1.75	6.11	185	53.62%
CISCI 2017	181	542	1305	2.41	7.21	82	45.30%
TOTAL	526	1749	3414	1.95	6.49	267	50.76%

We extend our gratitude to the co-editors of these proceedings for the hard work, energy and eagerness they shown preparing their respective sessions. We express our intense gratitude to Professor William Lesso (1931-2015) for his wise and opportune tutoring, for his eternal energy, integrity, and continuous support and advice, as the Program Committee Chair of past conferences, and as Honorary President of WMSCI 2017, as well as for being a very caring old friend and intellectual father to many of us. We also extend our gratitude to Professor Belkis Sánchez, who brilliantly managed the organizing process.

We would like also to extend our gratefulness to Professor Gradon Gill and Dr. Jeremy Horne for their continuous support in the conferences they participated in along the last 12 years as well as in the conferences they were not able to participate. In both cases: their advices and the kind of care they provided us with are highly valued and appreciated.

Many thanks to Drs. Sushil Archarya, Esther Zaretsky, and to professors Michael Savoie, Hsing-Wei Chu, Mohammad Siddique, Friedrich Welsch, Thierry Lefevre, José Vicente Carrasquero, Angel Oropeza, José Ferrer, for chairing and supporting the organization of conferences and/or special events or tracks in the context of, or collocated with, WMSCI 2017. We also wish to thank all the authors for the quality of their papers, the Program Committee members and the additional reviewers for their time and their contributions in the respective reviewing processes.

We also extend our gratitude to the following scholars, researchers, and professionals who accepted to deliver plenary workshops and/or to address the audience of the General Joint Plenary Sessions with keynote conferences.

Workshops and Conversational Sessions

Professor Thomas Marlowe, Seton Hall University, USA, Department of Mathematics and Computer Science, Program Advisor for Computer Science, Doctor in Computer Science, and Doctor in Mathematics.

Professor Shigehiro Hashimoto, Kogakuin University, Japan, Associate to the President and Dean of Admissions Center, Doctor of Engineering and Doctor of Medicine, Biomedical Engineering

Professor William Swart, East Carolina University, USA, College of Business, Former Provost and Vice Chancellor for Academic Affairs, Former Dean of Engineering at New Jersey Institute of Technology

Dr. Faith Power, Shenandoah University, USA, Visiting Professor of Entrepreneurship, Board Service: Free Medical Clinic of the NSV; Our Health; Byrd School of Business Advisory Board; Board of Trustees, Valley Health

Dr. Luis Velazquez-Araque, University of Guayaquil, Ecuador, Founder of the Aerodynamics, Laboratory at National University of Táchira, Venezuela, Visiting Professor at the Czech Technical University in Prague, Czech

Professor Andres Tremante, Florida International University, USA, The Mechanical & Materials Engineering (MME) Department

Plenary Keynote Speakers

Professor Thomas Marlowe, Seton Hall University, USA, Department of Mathematics and Computer Science, Program Advisor for Computer Science, Doctor in Computer Science, and Doctor in Mathematics.

Professor Shigehiro Hashimoto, Kogakuin University, Japan, Associate to the President and Dean of Admissions Center, Doctor of Engineering and Doctor of Medicine, Biomedical Engineering

Professor William Swart, East Carolina University, USA, College of Business, Former Provost and Vice Chancellor for Academic Affairs, Former Dean of Engineering at New Jersey Institute of Technology

Dr. Matthew E. Edwards, Alabama A&M University, USA, Professor of Physics and Former Dean, School of Arts and Sciences

Dr. Robert Cherinka, MITRE Corporation, USA, Senior Principal, Information Systems, Engineer, Department Head for Agile Engineering and Interoperability Leading a distributed team of IT professionals

Eng. Joseph Prezzama, MITRE Corporation, USA, Lead Communications Engineer, Leads the program in support of the Chief Information Officer (CIO) for the United States Special Operations Command (USSOCOM)

Prof. Dr. Dr. med. Ulrich Sprick, St. Alexius- / St. Josef Hospital, Germany, Chief Physician, Psychiatry and Psychotherapy

Dr. Russell Jay Hendel, Towson University, USA, Dept of Mathematics

Dr. Ashton T. Sperry, Ronin Institute for Independent Scholarship, USA, Research Scholar, Philosophy of Science, Decision and Game Theory, and Logic

Dr. Mario Lamanna, Evoelectronics, Italy and Selex-SI, USA, Senior Scientist

Professor Margit Scholl, Technical University of Wildau [FH], Germany, Faculty of Economics, Computer Science, Law, Business and Administrative Informatics, Received a research prize from TH Wildau.

Dr. Maria Jakubik, HAAGA-HELIA University of Applied Sciences, Finland, Hanken School of Economics, Head of Master's Degree, Programme in International Business Management (IBMA)

Dr. Anthea Fudge, University of South Australia, Course Coordinator of Science for Tertiary Learning, Blended Learning/Digital Technologies upon the Delivery of Science

Professor Louis Trudel, University of Ottawa, Canada, Faculty of Education, Science Education, ICT application in Science Learning and Teaching

Dr. Kevin Foltz, Institute for Defense Analyses, USA, Information Technology and Systems Division, Independent Technical Analyst for the Department of Defense

Professor Dusan Soltes, Comenius University at Bratislava, Slovakia, Faculty of Management, Director of the e-Europe Research & Development Centre

Dr. Ninon Candalh-Touta, Universite Pierre et Marie Curie (Paris VI), France, Robotic and Learning of the Laparoscopic Gesture

Dr. Jun Miyazaki, OrangeTechLab, Japan, Chief Executive Officer, Co-project Leader of Komazawa University and Visiting Collaborator at National Institute of Advanced Industrial Science and Technology

Dr. Sang E. Park, Harvard School of Dental Medicine, USA, Associate Dean for Dental Education Implemented the Flipped Classroom Educational Model at Harvard School of Dental Medicine

Jim Johnson, The Standish Group, USA, Founder and Chairman, 40 years of experience in the Computer Industry, Mission-Critical Applications and Technology

Fr. Dr. Joseph Laracy, Seton Hall University, USA, College of Arts and Sciences, Department of Mathematics and Computer Science, Complex Systems, Differential Equations, and Dynamical Systems

Dr. Giti Javidi, University of South Florida, Sarasota-Manatee, USA, Dep. of Information Technology Former Full Professor of Computer Science at Virginia State University (VSU)

Dr. Leônidas Conceição Barroso, Pontifícia Universidade Católica de Minas Gerais, Brasil

Faculdade de Ciências Empresarias, Ganador de Varios Premios Nacionales e Inter-Nacionales

Dra. María Dolores García Perea, Instituto Superior de Ciencias de la Educación del Estado de México, Professor and Researcher in Education.

Dr. Julio César González Mariño, Universidad Autónoma de Tamaulipas, México, Facultad de Medicina e Ingeniería Sistemas Computacionales, Profesor e Investigador Líder del cuerpo académico de Competencias Tecnológicas.

Dra. Eva María Olmedo Moreno, Universidad de Granada, España, Directora del Departamento de Métodos de Investigación y Diagnóstico en Educación

Our gratefulness is also extended to the organizations that provided scientific, academic, professional, or corporative co-sponsorships. The following are among these organizations:



Special Thanks to Dr. Jeremy Horne, Dr. Harvey Hyman, and Ms. Molly Youngblood Geiger (Google Partners Community Ambassador) for their efforts in helping us with the identification of above shown co-sponsors.

We extend our gratitude as well to María Sánchez, Juan Manuel Pineda, Marcela Briceño, Desireé Yonali Gamboa, and Freddy Callaos for their knowledgeable effort in supporting the organizational process, producing the hard copy and CD versions of the proceedings, developing and maintaining the software that support the interactions of the authors with the reviewing process and the Organizing Committee, as well as for their support in the help desk and in the promotional process and advising role in the promotion of the conference.

Professor Andrés Tremante, and
Professor Nagib Callaos (www.iiis.org/Nagib-Callaos)

IMSCI 2017 General Co-Chairs

IMSCI 2017
The 11th International Multi-Conference on Society, Cybernetics and Informatics
Special Track on Politics and Information Systems, Technologies and Applications: PISTA 2017
The 15th International Conference on Education and Information Systems, Technologies and Applications: EISTA 2017
Special Track on Social and Organizational Informatics and Cybernetics: SOIC 2017

CONTENTS

Contents	i
Educational Research, Theories, Practice and Methodologies (EISTA 2017)	
Karulis, Miervaldis (Latvia): "Perspectives in the Medical Latin Language E-Testing"	1
LaValle, Joe (USA): "'Real Language': Combining Intermediate Spanish Language Learners and ESOL/Native Speakers for Vernacular Language Acquisition"	6
Peng, Michael Yao-Ping; Ho, Sophia Shi-Huei (Taiwan): "Study on the Influence of Students' Social Capital and International Mindset on Employability: Taking Students' Learning Outcomes as Mediator"	12
eHealth	
Sprick, Ulrich; Köhne, Martin (Germany): "Internet Psychotherapy with „Net-Step“ - A Therapist Delivered Tool for the Treatment of Depression and Anxiety Disorders in Primary Care Patients Tested in a Pilot RCT"	18
Impact of Informatics and Cybernetics on Societies and Cultures	
Figuroa-Tejada, Gisella; Sotil, Andrés; Un Jan, Alberto (Peru): "Reducing the Effect of Local Conditions on the Capacity Intersection Approaches with the Support of Intelligent Transportation Identification Software"	24
Information Society Technologies	
Orantes-Jiménez, Sandra-Dinora; Vázquez-Álvarez, Graciela; Tejeida-Padilla, Ricardo (Mexico): "Impact of Customer Relationship Management on Customer Loyalty, Customer Retention and Customer Profitability for Hotelier Sector"	28
Integrating Research, Education, and Problem Solving	
Bernikova, Olga; Redkin, Oleg (Russian Federation): "The Use of the Media in Arabic Language Teaching and Research"	34
Braman, James; Yancy, Barbara (USA): "Infusing Writing and Research in Technology Courses through Multi-User Virtual Environments"	40
Natale, Kirstin; Servilio, Kathryn (USA): "The Integration of Research and Education: Graduate Research Assistantship"	44

Suzuki, Akiyoshi; Nakamura, Norio; Kurata, Shin; Matsumoto, Kōichi (Japan): "Using Modern Technology to Address Traditional Geographic and Economic Limitations in Education" 50

Vera, Ricardo; Nuño, José Pablo (Mexico): "A Transcendental Decision Making Model" 56

Interdependencies between Society and Information and Communication Technologies

Baybars Hawks, Banu (Turkey): "Assessing Changes in Turkish Public Opinion: Current Trends and Future Prospects" 62

Social and Societal Roles of Information and Communications Technologies

Ndwe, Tembalethu J.; Jumbam, Ndze D.; Isabirye, Naomi (South Africa): "UCD Pre-Design Research Methods in ICT for Development" 67

Rustanta, Agustinus; Kali Palindangan, Linus (Indonesia): "Therapeutic Communication: Phenomenology Analysis to Former Mental Disorder Survivors in Recovering Mental Illness Patients" 73

Informatics and Society

Gribanova, Galina; Nevzorov, Maxim (Russian Federation): "Virtual Ethnic Communities as Political Actors – The Case of Sami People" 77

Peicheva, Dobrinka; Milenkova, Valentina; Manov, Boris; Raycheva, Lilia (Bulgaria): "The ICT, E-Reading and Media Ecosystem " 83

Application of Education Technologies

Garcia Quan, Clarisa (Guam): "The Pros and Cons of Requiring SCRATCH in the Applied Linguistics Classroom: Student and Student-Teachers' Reactions and Recommendations, Instructor's Observations" 87

Molinsky, Rivka (USA): "Student Satisfaction and Outcomes of the Touro College iPad Program" 93

Sharmin, Aklima *; Lutfeali, Shirin ** (* Bangladesh, ** USA): "A Journey to Reading Hub: A Repository of Bangla Reading Skill Development through Technology" 97

Trudel, Louis; Métioui, Abdeljalil (Canada): "Participation of Student Teachers in a Video-Based Laboratory in Kinematics: A Multimodal Case Study" 103

Zhang, Lei; Sharma, Dinesh; Whiteley, Benjamin; Dabipi, Ibibia (USA): "Design and Develop of Virtual Reality Game Based Examination for STEM Education" 109

Applications of Information and Communication Technologies in Education and Training

- Adadi, Elizabeth (USA): "Mobile Technologies and Motivation...Influential Drivers of Learner Control?" 112
- Ilunga, Masengo (South Africa): "An Approach for Achieving Matrix Consistency in AHP for an Online Module Evaluation" 117
- Mao, Weihsun (USA): "Teaching and Learning Chinese Language on CMS" 121
- Vogelsang, Kristin; Hagerer, Ilse; Liere-Netheler, Kirsten; Hoppe, Uwe (Germany): "Analysis of the Use of Digital Media to Design a Blended Learning Environment by the Example of a Master Course Lecture" 127

Education and Training Systems and Technologies

- Beranek, Marek; Kovar, Vladimir (Czech Republic): "Cloud-Based University Information System" 132
- Candalh-Touta, Ninon; Szewczyk, Jérôme (France): "How Can We Improve the Training of Laparoscopic Surgery Thanks to the Knowledge in Robotics?" 137
- Javidi, Giti; Sheybani, Ehsan (USA): "Empowering Teachers to Raise Career Awareness in Computing: Lessons Learned" 143
- O'Sullivan, Jill Anne (USA): "Social Media Integrated into ERP Undergraduate Curriculum at Farmingdale State College for Student Preparation into the Workforce" 149
- Shahzad, Farrukh *; Alwosaibi, Fathi M. ** (* USA, ** Saudi Arabia): "Development of an e-Library Web Application" 153
- Stokes, Jennifer; Price, Bianca (Australia): "Social Media, Visual Culture and Contemporary Identity" 159

Education in Science, Technology, Engineering and Mathematics

- Smyrniou, Zacharoula; Georgakopoulou, Elena; Sotiriou, Menelaos; Sotiriou, Sofoklis (Greece): "The Learning Science through Theatre Initiative in the Context of Responsible Research and Innovation" 164
- Trudel, Louis; Métioui, Abdeljalil (Canada): "High School Students' Understanding of the Concept of Relative Motion Using a Video-Based Laboratory in Physics Education" 170
- Zhou, Bin (Brenda); Anderson, Clifford; Wang, Feng; Li, Lin (USA): "Perceptions and Preferences of High School Students in STEM: A Case Study in Connecticut and Mississippi" 175

Educational Research, Theories, Practice and Methodologies

- De Souza Martins, Marlucio; Posada-Bernal, Sandra; Lucio-Tavera, Paula Andrea (Colombia): "Physical Education in the Early Childhood: A Perspective of Investigation in Education from the Neuroscience" 181
- Hendel, Russell Jay (USA): "Are We Meeting Pedagogic Requirements? – The Quadratic Equation" 185
- Iordanou, Kalypso *; Kuhn, Deanna ** (* Cyprus, ** USA): "Examining Collaborative and Adversarial Argumentation on the Computer in Supporting Students' Ability to Construct Evidence-Based Arguments" 191
- Lee, Kwanchun; Choi, Soo Yeon; Choi, Un Shil (South Korea): "A Study on the Meaning of the 'Lifelong Learning to Be' Implicated in the Philosophy of Nietzsche" 195
- Maciel, Flaviana; Acioly, Mariana; Fragoso, Viviane; Santos, Thalita; Martins, Carolina (Brazil): "Tutorial Continuing Education: Innovative Strategy in a Tertiary Specialized Health Unit" 201

Innovative Curriculum and Teaching Techniques

- Budnik, Mark M.; Thomas, Rebecca; Rosasco, Nicholas; Thomas, Stewart (USA): "An Active Learning Module to Introduce Students to the Importance of Flowcharts and Technical Documentation" 207
- Islam, Rafiqul; Jannik, Adam; Al Sharab, Jafar; Benalla, Mohammed (USA): "Curriculum Development of an Enhanced Automation and Control Course by Emphasizing on Programmable Logic Controllers in Electronics Engineering Technology Program" 213
- Xu, Wenjuan; Pan, Xunyu (USA): "Teach Network Forensics Course with Experiential Learning" 218

Relations between Society/Organizations and Cybernetics/Cyber-Technologies

- Leclerc-Sherling, Christine (USA): "Macro, Meso, and Micro Impact of Terrorism" 223

Authors Index

227



Pages 1-226 are not included in this book preview.

To view the papers, please, click the “Home” button at the top of this page, and then, click the “Papers” link for this volume.



AUTHORS INDEX

Acioly, Mariana	201	Lucio-Tavera, Paula Andrea	181
Adadi, Elizabeth	112	Lutfeali, Shirin	97
Al Sharab, Jafar	213	Maciel, Flaviana	201
Alwosaibi, Fathi M.	153	Manov, Boris	83
Anderson, Clifford	175	Mao, Weihsun	121
Baybars Hawks, Banu	62	Martins, Carolina	201
Benalla, Mohammed	213	Matsumoto, Kōichi	50
Beranek, Marek	132	Métioui, Abdeljalil	103; 170
Bernikova, Olga	34	Milenkova, Valentina	83
Braman, James	40	Molinsky, Rivka	93
Budnik, Mark M.	207	Nakamura, Norio	50
Candalh-Touta, Ninon	137	Natale, Kirstin	44
Choi, Soo Yeon	195	Ndwe, Tembalethu J.	67
Choi, Un Shil	195	Nevzorov, Maxim	77
Dabipi, Ibibia	109	Nuño, José Pablo	56
De Souza Martins, Marlucio	181	O'Sullivan, Jill Anne	149
Figuerola-Tejada, Gisella	24	Orantes-Jiménez, Sandra-Dinora	28
Fragoso, Viviane	201	Pan, Xunyu	218
Garcia Quan, Clarisa	87	Peicheva, Dobrinka	83
Georgakopoulou, Elena	164	Peng, Michael Yao-Ping	12
Gribanova, Galina	77	Posada-Bernal, Sandra	181
Hagerer, Ilse	127	Price, Bianca	159
Hendel, Russell Jay	185	Raycheva, Lilia	83
Ho, Sophia Shi-Huei	12	Redkin, Oleg	34
Hoppe, Uwe	127	Rosasco, Nicholas	207
Ilunga, Masengo	117	Rustanta, Agustinus	73
Iordanou, Kalypso	191	Santos, Thalita	201
Isabirye, Naomi	67	Servilio, Kathryn	44
Islam, Rafiqul	213	Shahzad, Farrukh	153
Jannik, Adam	213	Sharma, Dinesh	109
Javidi, Giti	143	Sharmin, Aklima	97
Jumbam, Ndze D.	67	Sheybani, Ehsan	143
Kali Palindangan, Linus	73	Smyrnaïou, Zacharoula	164
Karulis, Miervaldis	1	Sotil, Andrés	24
Köhne, Martin	18	Sotiriou, Menelaos	164
Kovar, Vladimir	132	Sotiriou, Sofoklis	164
Kuhn, Deanna	191	Sprick, Ulrich	18
Kurata, Shin	50	Stokes, Jennifer	159
LaValle, Joe	6	Suzuki, Akiyoshi	50
Leclerc-Sherling, Christine	223	Szewczyk, Jérôme	137
Lee, Kwanchun	195	Tejeida-Padilla, Ricardo	28
Li, Lin	175	Thomas, Rebecca	207
Liere-Netheler, Kirsten	127	Thomas, Stewart	207

Trudel, Louis	103; 170
Un Jan, Alberto	24
Vázquez-Álvarez, Graciela	28
Vera, Ricardo	56
Vogelsang, Kristin	127
Wang, Feng	175
Whiteley, Benjamin	109
Xu, Wenjuan	218
Yancy, Barbara	40
Zhang, Lei	109
Zhou, Bin (Brenda)	175