## Contents

**Internet of Things**

**Cloud-Based Industrial Control Services.** 3  
Reinhard Langmann and Michael Stiller

**Wireless Development Boards to Connect the World.** 19  
Pedro Plaza, Elio Sancristobal, German Carro, Manuel Castro, and Elena Ruiz

**CHS-GA: An Approach for Cluster Head Selection Using Genetic Algorithm for WBANs.** 28  
Roopali Punj and Rakesh Kumar

**Proposal IoT Architecture for Macro and Microscale Applied in Assistive Technology.** 36  
Carlos Solon S. Guimarães, Jr., Renato Ventura B. Henriques, Carlos Eduardo Pereira, and Wagner da Silva Silveira

**Using Industrial Internet of Things to Support Energy Efficiency and Management: Case of PID Controller.** 44  
Tom Wanyama

**MODULARITY Applied to SMART HOME.** 56  
Doru Ursuțiu, Andrei Neagu, Cornel Samoilă, and Vlad Jinga

**Development of M.Eng. Programs with a Focus on Industry 4.0 and Smart Systems.** 68  
Michael D. Justason, Dan Centea, and Lotfi Belkhir

**Remote Acoustic Monitoring System for Noise Sensing.** 77  
Unai Hernandez-Jayo, Rosa Ma Alsina-Pagès, Ignacio Angulo, and Francesc Àlías
Web Experimentation on Virtual and Remote Laboratories ............... 205
Daniel Galan, Ruben Heradio, Luis de la Torre, Sebastián Dormido, and Francisco Esquembre

How to Leverage Reflection in Case of Inquiry Learning?
The Study of Awareness Tools in the Context of Virtual and Remote Laboratory .......................................................... 220
Rémi Venant, Philippe Vidal, and Julien Broisin

Role of Wi-Fi Data Loggers in Remote Labs Ecosystem .................. 235
Venkata Vivek Gowripeddi, B. Kalyan Ram, J. Pavan, C.R. Yamuna Devi, and B. Sivakumar

Flipping the Remote Lab with Low Cost Rapid Prototyping Technologies ............................................................... 250
J. Chacón, J. Saenz, L. de la Torre, and J. Sánchez

Remote Experimentation with Massively Scalable Online Laboratories .............................................................. 258
Lars Thorben Neustock, George K. Herring, and Lambertus Hesselink

Object Detection Resource Usage Within a Remote Real-Time Video Stream. ................................................................. 266
Mark Smith, Ananda Maiti, Andrew D. Maxwell, and Alexander A. Kist

Integrating a Wireless Power Transfer System into Online Laboratory: Example with NCSTab .............................................. 278
Zhongcheng Lei, Wenshan Hu, Hong Zhou, and Weilong Zhang

Spreading the VISIR Remote Lab Along Argentina.
The Experience in Patagonia ............................................................... 290
Unai Hernandez-Jayo, Javier Garcia-zubia, Alejandro Francisco Colombo, Susana Marchisio, Sonia Beatriz Concarci, Federico Lerro, Maria Isabel Pozzo, Elsa Dobboletta, and Gustavo R. Alves

Educational Scenarios Using Remote Laboratory VISIR for Electrical/Electronic Experimentation ........................................ 298
Felix Garcia-Loro, Ruben Fernandez, Mario Gomez, Hector Paz, Fernando Soria, Maria Isabel Pozzo, Elsa Dobboletta, Andre Fidalgo, Gustavo Alves, Elio Sancristobal, Gabriel Diaz, and Manuel Castro

Use and Application of Remote and Virtual Labs in Education

Robot Online Learning Through Digital Twin Experiments:
A Weightlifting Project ............................................................... 307
Igor Verner, Dan Cuperman, Amy Fang, Michael Reitman, Tal Romm, and Gali Balikin
Parallel Use of Remote Labs and Pocket Labs in Engineering Education ................................................... 452
Thomas Klinger, Danilo Garbi Zutin, and Christian Madritsch

The Effectiveness of Online-Laboratories for Understanding Physics .... 459
David Boehringer and Jan Vanvinkenroye

Remote Control and Measurement Technologies
On the Fully Automation of the Vibrating String Experiment ........... 469
Javier Tajuelo, Jacobo Sáenz, Jaime Arturo de la Torre, Luis de la Torre,
Ignacio Zúñiga, and José Sánchez

Identifying Partial Subroutines for Instrument Control Based on Regular Expressions ....................................... 483
Ananda Maiti, Alexander A. Kist, and Andrew D. Maxwell

Internet of Things Applied to Precision Agriculture .................. 499
Roderval Marcelino, Luan C. Casagrande, Renan Cunha, Yuri Crotti,
and Vilson Gruber

Computer Vision Application for Environmentally Conscious
Smart Painting Truck .......................................................... 510
Ahmed ElSayed, Gazi Murat Duman, Ozden Tozanli, and Elif Kongar

Remote Monitoring and Detection of Rail Track Obstructions ........ 517
Mohammed Misbah Uddin, Abul K.M. Azad, and Veysel Demir

Improving Communication Between Unmanned Aerial Vehicles
and Ground Control Station Using Antenna Tracking Systems ...... 532
Sebastian Pop, Marius Cristian Luculescu, Luciana Cristea,
Constantin Sorin Zamfira, and Attila Laszlo Boer

Remote RF Testing Using Software Defined Radio ....................... 540
Stephen Miller and Brent Horine

Remote Control of Large Manufacturing Plants Using Core
Elements of Industry 4.0 ....................................................... 546
Hasan Smajic and Niels Wessel

Games Engineering
Dinner Talk: A Language Learning Game Designed
for the Interactive Table ...................................................... 555
Jacqueline Schuldt, Stefan Sachse, and Lilianne Buckens

The Experimento Game: Enhancing a Players’ Learning Experience
by Embedding Moral Dilemmas in Serious Gaming Modules ........ 561
Jacqueline Schuldt, Stefan Sachse, Verena Hetsch, and Kevin John Moss
The Finite State Trading Game: Developing a Serious Game to Teach the Application of Finite State Machines in a Stock Trading Scenario ........................................ 570
Matthias Utesch, Andreas Hauer, Robert Heininger, and Helmut Krcmar

A Serious Game for Learning Portuguese Sign Language - “iLearnPSL” ........................................ 583
Marcus Torres, Vítor Carvalho, and Filomena Soares

The Implementation of MDA Framework in a Game-Based Learning in Security Studies ................................ 596
Jurike V. Moniaga, Maria Seraphina Astriani, Sharon Hambali, Yangky Wijaya, and Yohanes Chandra

Industrial Virtual Environments and Learning Process .............. 609
Jean Grieu, Florence Lecroq, Hadhoum Boukachour, and Thierry Galinho

How Game Design Can Enhance Engineering Higher Education: Focused IT Study ................................. 619
Olga Dziabenko, Valentyna Yakubiv, and Lyubov Zinyuk

Physioland - A Serious Game for Rehabilitation of Patients with Neurological Diseases ........................... 628
Tiago Martins, Vítor Carvalho, and Filomena Soares

Human Computer Interfaces, Usability, Reusability, Accessibility

The Development of ICT Tools for E-inclusion Qualities. ........... 645
Dena Hussain

Insights Gained from Tracking Users’ Movements Through a Cyberlearning System’s Mediation Interface ................... 652
Daniel Stuart Brogan, Debarati Basu, and Vinod K. Lohani

Practical Use of Virtual Assistants and Voice User Interfaces in Engineering Laboratories .......................... 660
Michael James Callaghan, Victor Bogdan Putinelu, Jeremy Ball, Jorge Caballero Salillas, Thibault Vannier, Augusto Gomez Eguiluz, and Niall McShane

Approaching Emerging Technologies: Exploring Significant Human-Computer Interaction in the Budget-Limited Classroom ...... 672
James Wolfer

Touching Is Believing - Adding Real Objects to Virtual Reality ...... 681
Paulo Menezes, Nuno Gouveia, and Bruno Patrão

The Importance of Eye-Tracking Analysis in Immersive Learning - A Low Cost Solution ............................ 689
Paulo Menezes, José Francisco, and Bruno Patrão
Simulation

Augmented Reality-Based Interactive Simulation Application in Double-Slit Experiment ...................................................... 701
Tao Wang, Han Zhang, Xiaoru Xue, and Su Cai

Developing Metacognitive Skills for Training on Information Security .............................................................. 708
Jesus Cano, Roberto Hernandez, Rafael Pastor, Salvador Ros, Llanos Tobarra, and Antonio Robles-Gomez

Optimization of the Power Flow in a Smart Home ........................................ 721
Linfeng Zhang and Xingguo Xiong

Online Engineering

GIFT - An Integrated Development and Training System for Finite State Machine Based Approaches ........................................ 743
Karsten Henke, Tobias Fäth, René Hutschenreuter, and Heinz-Dietrich Wuttke

A Web-Based Tool for Biomedical Signal Management ................................................ 758
S.D. Cano-Ortiz, R. Langmann, Y. Martinez-Cañete, L. Lombardia-Legra, F. Herrero-Betancourt, and H. Jacques

Optimization of Practical Work for Programming Courses in the Context of Distance Education .......................... 764
Amadou Dahirou Gueye, Pape Mamadou Djidiack Faye, and Claude Lishou

Enabling the Automatic Generation of User Interfaces for Remote Laboratories ........................................ 778
Wissam Halimi, Christophe Salzmann, Hagop Jamkojian, and Denis Gillet

A Practical Approach to Teaching Industry 4.0 Technologies ................................................................. 794
Tom Wanyama, Ishwar Singh, and Dan Centea

Design of WEB Laboratory for Programming and Use of an FPGA Device ...................................................... 809
Nikola Jović and Milan Matijević

Remote Triggered Software Defined Radio Using GNU Radio ...................................................... 822
Jasveer Singh T. Jethra, Pavneet Singh, and Kunal Bidkar
Open Educational Resources

MOOC in a School Environment: ODL Project .......................... 833
Olga Dziabenko and Eleftheria Tsourlidaki

Survey and Analysis of the Application of Massive Open Online Courses (MOOCs) in the Engineering Education in China .............. 840
Yu Long, Man Zhang, and Weifeng Qiao

Conversion of a Software Engineering Technology Program to an Online Format: A Work in Progress and Lessons Learned ........ 851
Jeff Fortuna, Michael D. Justason, and Ishwar Singh

Increasing the Value of Remote Laboratory Federations Through an Open Sharing Platform: LabsLand .............................. 859
Pablo Orduña, Luis Rodriguez-Gil, Javier Garcia-Zubia, Ignacio Angulo, Unai Hernandez, and Esteban Azcuenaga

Standardization Layers for Remote Laboratories as Services and Open Educational Resources ........................................... 874
Wissam Halimi, Christophe Salzmann, Denis Gillet, and Hamadou Saliah-Hassane

Present and Future Trends Including Social and Educational Aspects

Innovative Didactic Laboratories and School Dropouts: A Case Study ................................................................. 887
Carole Salis, Marie Florence Wilson, Fabrizio Murgia, and Stefano Leone Monni

Intellectual Flexible Platform for Smart Beacons ...................... 895
Galyna Tabunshchyk and Dirk Van Merode

An Approach for Implementation of Artificial Intelligence in Automatic Network Management and Analysis ...................... 901
Avishek Datta, Aashi Rastogi, Oindrila Ray Barman, Reynold D’Mello, and Omar Abuzaghleh

Investigation of Music and Colours Influences on the Levels of Emotion and Concentration ............................................. 910
Doru Ursuțiu, Cornel Samoilă, Stela Drăgulin, and Fulvia Anca Constantin

Framework for the Development of a Cyber-Physical Systems Learning Centre .......................................................... 919
Dan Centea, Ishwar Singh, and Mo Elbestawi
Applications and Experiences

The Use of eLearning in Medical Education and Healthcare Practice – A Review Study ............................................. 933
Blanka Klimova

Efficiency and Prospects of Webinars as a Method of Interactive Communication in the Humanities ................................. 940
Natalya Nikolaevna Petrova, Lyudmila Pavlovna Sidorenko, Svetlana Germanovna Absalyamova, and Rustem Lukmanovich Sakhapov

Port Logistics: Improvement of Import Process Using RFID .............. 949
Ignacio Angulo, Unai Hernandez-Jayo, and Javier Garcia-Zubia

Integration of an LMS, an IR and a Remote Lab .......................... 957
Ana Maria Beltran Pavani, William de Souza Barbosa, Felipe Calliari, Daniel B. de C. Pereira, Vanessa A. Palomo Lima, and Giselen Pestana Cardoso

Artificial Intelligence and Collaborative Robot to Improve Airport Operations ......................................................... 973
Frédéric Donadio, Jérémy Frejavielle, Stanislas Larnier, and Stéphane Vetault

Jose Divitt Velosa, Luis Cobo, Fernando Castillo, and Camilo Castillo

Sketching 3D Immersed Experiences Rapidly by Hand Through 2D Cross Sections .............................................. 1001
Frode Eika Sandnes

Analyzing Modular Robotic Systems ...................................... 1014
Reem Alattas

An Educational Physics Laboratory in Mobile Versus Room Scale Virtual Reality - A Comparative Study .............................. 1029
Johanna Pirker, Isabel Lesjak, Mathias Parger, and Christian Gütl

Human Interaction Lab: All-Encompassing Computing Applied to Emotions in Education ......................................... 1044

Distance Learning System Application for Maritime Specialists Preparing and Corresponding Challenges Analyzing .................. 1050
Vladlen Shapo

Author Index ............................................................................... 1059
Online Engineering & Internet of Things
Proceedings of the 14th International Conference on
Remote Engineering and Virtual Instrumentation REV
2017, held 15-17 March 2017, Columbia University, New
York, USA
Auer, M.E.; Zutin, D.G. (Eds.)
2018, XXI, 1062 p. 552 illus., Softcover
ISBN: 978-3-319-64351-9