



REV2021 February 24–26, 2021, Novotel Century *Online*, Hong Kong

Session Overview

Date: Wednesday, 24/Feb/2021

2:00pm

-

5:00pm

4:30pm

-

6:30pm

WS2: Digital Design on Remote FPGAs and the Impact on Students' Learning

Chair: **Rania Hussein**, University of Washington

Chair: **Candido Aramburu**, Public University of Navarre VAT ESQ3150012G

Chair: **Pablo Orduña**, LabsLand

Date: Thursday, 25/Feb/2021

12:00pm

-

1:30pm

2:00pm

-

2:15pm

WS3: Remote FPGA Based Laboratory to Foster Microelectronic

Chair: **Pedro Plaza**, UNED

P1: Conference Opening

Chair: **Michael E. Auer**, CTI International Frankfurt

- Opening Speech by IAOE President Kalyan Ram B
- Tribute to Doru Ursutiu

P2: Keynote

Chair: **Doru Ursutiu**, TRANSILVANIA University of Brasov - AOSR Romania

LabVIEW – Past, Present and Future

Jeff Kodosky,

NI

3:15pm

-

4:45pm

1A: Parallel Session

Chair: **Michael E. Auer**, CTI International Frankfurt

Special Session on the occasion of the 70th Birthday of Doru Ursutiu

GOLDi 2.0: Beyond Raw Digital Signals – Electrical Interface Emulation

Karsten Henke, Johannes Nau, Robert Niklas Bock
Ilmenau University of Technology, Germany

Towards A Universally Accessible Laboratory In The Teaching And Learning Of Electronic And Computer Engineering

Ian Andrew Grouit
University of Limerick, Ireland

IIoT Laboratory Model for Remote Control System Applications

Marjan Golob, Božidar Bratina, Milan Rotovnik, Nenad Muškinja
University of Maribor, Slovenia

Interactive Lab Experimentation And Simulation Tools For Remote Laboratories

Fariba Moghaddam¹, Aldo Vaccari¹, Denis Gillet², Yves Piguet², Christophe Salzmann²

1B: Parallel Session

Chair: **Abul Azad**, NIU

Augmented Reality-based Product Validation to Support Collaborative Engineering of Complex Technical Systems

Daniel Eckertz, Harald Anacker, Roman Dumitrescu
Fraunhofer Institute for Mechatronic Systems Design IEM

Human-Centered Design in Online Laboratories for Graduate Engineering Students

Zhongcheng Lei, Hong Zhou, Wenshan Hu, Guo-Ping Liu
Wuhan University, China, People's Republic of

Termolabo Project: An Internet of Things Approach of Thermo-Fluids Online Laboratory

Oswaldo Andrés Vanegas Guillén^{1,2}, José Leonardo Benavides Maldonado³, Javier Muñoz Antón², Janeth Pilar Díaz Vera¹, Carlos Hugo Lozada Cabrera⁴

1: Universidad de Guayaquil, Ecuador; 2: Universidad Politécnica de Madrid, España; 3: Universidad Nacional de Loja, Ecuador; 4: Universidad Politécnica Salesiana, Ecuador

On the Development of a Unified Remote Laboratory Framework

Johannes Nau, Johannes Richter, Detlef Streitferdt, Karsten Henke, Robert Niklas Bock, Andreas Mitschele-Thiel
Technische Universität Ilmenau, Germany

Design and development of an ultra-concurrent laboratory for the study of an Acid-Base Titration (ABT) at the Universidad Estatal a Distancia (UNED), Costa Rica

Carlos Arguedas-Matarrita¹, Eric Montero-Miranda¹, Laura Vargas-Badilla¹, Ronald Sánchez-Brenes¹, Eduard Rios-Badilla¹, Pablo Orduña², Luis

1: HES-SO, Switzerland; 2: EPFL, Switzerland

Rodríguez-Gil²

1: Universidad Estatal a Distancia, Costa Rica; 2: LabsLand

5:00pm
-
6:00pm

P3: Keynotes

Chair: **Dominik May**, University of Georgia

Twenty Five Years in Remote Experimentation

Javier Garcia-Zubia¹, **Gustavo Alves²**

1: University of Deusto, Spain; 2: ISEP Porto, Portugal

Use of Assisted and Augmented Reality to Optimize Injection Molding Production

Raphael Rohde

Phoenix Contact, Germany

6:15pm
-
8:00pm

2A: Parallel Session

Chair: **Abul Azad**, NIU

GOLC Award Winning Labs

2B: Parallel Session

Chair: **Maria Teresa Restivo**, LAETA-INEGI, Fac. Engineering, Univ Porto

Chair: **James Wolfer**, Indiana University South Bend

Special Session: **Biomedical Engineering and Computing (BiomEC'21)**

Impact of Biofeedback in the Motor Rehabilitation of Patients with Acquired Brain Injury

Paulo Abreu¹, **Maria Teresa Restivo¹**, **Helena Sousa²**

1: Faculty of Engineering, Portugal; 2: School of Health, Polytechnic of Porto, Portugal

Assessing mHealth Applications for Medical Prescription: a Case Study

Mario A. Bochicchio¹, **Lucia Vaira¹**, **Andrea Mortara²**, **Renata De Maria³**

1: Department of Engineering of Innovation, University of Salento, Italy; 2: Department of Cardiology, Monza Polyclinic, Italy; 3: National Research Council, Institute of Clinical Physiology, ASST Great Metropolitan Hospital Niguarda, Italy

A different view on Artificial Intelligence applications for Cardiac Arrhythmia Detection and Classification

Dragoş-Vasile Bratu, **Maria-Alexandra Zolya**, **Sorin-Aurel Moraru**

Transilvania University of Braşov, Romania

Cloud-Based Data Storage System for eHealth Smart Devices

Paulo Abreu, **Maria Teresa Restivo**

LAETA-INEGI, Fac. Engineering, University of Porto, Portugal

Large Scale Covid-19 Detection with Blood Platelets Using Artificial Neural Network

Ahmed Tamer, **Andreas Pester**

The British University in Egypt, Austria

GiroJampa: A Serious Game Prototype For Wheelchairs Rehabilitation

Marieliza Araújo Braga, **Liliane dos Santos Machado**, **Leonardo Wanderley Lopes**, **Clauriton de Albuquerque Siebra**, **Elaine Cappellazzo Souto**, **Rebeca Raab Bias Ramos**

UNIVERSIDADE FEDERAL DA PARAÍBA, Brazil

Date: Friday, 26/Feb/2021

10:00am
-

11:00am

P4: Keynotes

Chair: **Kalyan Ram Bhimavaram**, Electrono Solutions Pvt Ltd

Transforming Engineering Education in India using Remote and Virtual Technologies in the COVID Era

Krishna Vedula

IUCEE, India

Smart Tourism – Based on the Application Research of Smart Scenic Spots in China

Xiaoguang Yue

International Engineering and Technology Institute (IETI) Hong Kong

11:15am
-

12:45pm

3A: Parallel Session

Chair: **Dominik May**, University of Georgia

Forecasting and Monitoring Smart Buildings with IoT, Digital Twin and Blockchain

Xichun Yang¹, **Jinhao Jiang¹**, **Ananda Maiti¹**, **Alexander Kist²**

1: University of Tasmania, Australia; 2: University of Southern Queensland, Australia

RISC-V Online Tutor

Fearghal Morgan, **Arthur Beretta**, **Ian Gallivan**, **Joseph Clancy**, **Frederic Rousseau**, **Roshan George**, **László Bakó**, **Frank Callaly**

National University of Galway, Ireland

Physically Realistic Simulation of Mechanical Assembly Operations in a Virtual Reality Training Environment

Florian Dyck¹, **Marc Pilates²**, **Lisa Masjutin³**, **Jörg Stöcklein¹**

1: Fraunhofer Institute for Mechatronic Systems Design IEM, Germany; 2: Hamm-Lippstadt University of Applied Sciences, Germany; 3: Bielefeld University, Germany

A Reliable Real-time Web Interface for an Online Laboratory

Ratchatin Chancharoen, **Natthakorn Suwan-opaskul**, **Tanapoom Jitnakanan**,

3B: Parallel Session

Chair: **Giovanni Romagnoli**, University of Parma

Special Session: **Non-traditional Labs and Lab Networks in the IoT and Industry 4.0 Domain**

Towards the Operationalization of Trust Relationships in Networked Organizations

Valentin Kammerlohr^{1,2}, **David Paradice²**, **Jannicke Baalsrud Hauge^{3,4}**, **Heiko Duin⁴**

1: Hochschule Für Technik Stuttgart, Stuttgart, Germany; 2: Auburn University College of Business, Auburn, USA; 3: KTH-Royal Institute of Technology, Södertälje, Sweden; 4: BIBA – Bremer Institut Für Produktion Und Logistik GmbH, Bremen, Germany

Batch Experiment: A Fruitful Way of Combining Hands-On Laboratory and E-Learning

Eleonora Bottani, **Davide Reverberi**, **Giovanni Romagnoli**, **Maria Ustenko**, **Andrea Volpi**

University of Parma, Italy

Challenges and Solutions to Integrate Remote Laboratories in a Cross-university Network

Hadi Adineh¹, **Matteo Galli²**, **Birte Heinemann³**, **Nils Höhner⁴**, **Davide Mezzogori²**, **Matthias Ehlenz⁵**, **Dieter Uckelmann¹**

1: Hochschule für Technik Stuttgart, Schellingstraße 24, 70174 Stuttgart; 2:

Kantawatchr Chaiprabha, Soravis Tangthavonsirikul, Pasawee Pungrasmi, Keerati Tantrapirom
Chulalongkorn university, Thailand

Automated Testing for Sustainable Remote Laboratory System
Narasimhamurthy Kyathsandra Chandrashekar, Susheen Srivatsa Chelur Nataraja, Bharath Gangarpu Chandrasekhar, Adithya Prasanna, Suchitra Vankalkunti
Siddaganga Institute of Technology, India

Department of Engineering and Architecture, University of Parma, Parco Aree delle Scienze, 181/A, 43124, Parma, Italy; 3: Learning Technologies, RWTH Aachen University, Ahornstr. 55, 52704 Aachen (Germany); 4: University of Koblenz-Landau; 5: RWTH Aachen University

Design of a Mixed Reality Game for Exploring how IoT Technologies Can Support the Decision Making Process

Jannicke Madeleine Baalsrud Hauge^{1,2}, Prabahan Basu¹, Fatima Sundus¹, Artem Schurig¹, Anidya Chowdry¹
1: Bremer Institut für Produktion und Logistik, Germany; 2: Kungliga Tekniska Högskolan, Sweden

Real-time Fluid Simulation for an interactive Plate Column Virtual Lab

Mario Wolf, Pascalis Trentsios, Detlef Gerhard
Ruhr-University Bochum, Germany

4B: Parallel Session

Chair: Thrasylvoulos-Konstantinos Tsiatsos, Aristotle University of Thessaloniki

Short Papers

Remotely Teaching Engineering Courses During A Pandemic

Patrick Robert Kane
Infineon, United States of America

Smart Innovative Engineering for Smart Agriculture Modernization

Galyna Tabunshchyk¹, Peter Arras², Karsten Henke³, Dieter Wuttke³
1: National University Zaporizhzhia Polytechnic, Ukraine; 2: KU Leuven; 3: Ilmenau University of Technology

Aligning Technic with Didactic – A Remote Laboratory Infrastructure for Study, Teaching and Research

Anke Pfeiffer, Hadi Adineh, Dieter Uckelmann
Hochschule für Technik Stuttgart, Germany

Main Attacks and Ways to Keep Security Guidelines Updated in Remote Laboratories.

Emilio Werner¹, Jhennifer Cristine Matias¹, Marcelo Daniel Berejuck¹, Hamadou Saliah-Hassane²
1: University of Santa Catarina, Brazil; 2: Université TÉLUQ, Canada

Comparison of Two Approaches for Digital Payments: Challenges and Future Directions

Galena Pisoni¹, Bálint Molnár², Ádám Tarcsi²
1: Université Côte d'Azur, Nice, France; 2: Eötvös Loránd University, ELTE

Remote Labs For Communications

Somashekar Manjunath¹, Preethi Biradar², Kalyan Ram Bhimavaram³, Panchaksharaya Hiremath⁴, Arun Kumar⁵
1: M S RAMAIAH UNIVERSITY OF APPLIED SCIENCES, India; 2: Electrono Solutions Pvt. Ltd.; 3: Electrono Solutions Pvt. Ltd.; 4: Electrono Solutions Pvt. Ltd.; 5: Electrono Solutions Pvt. Ltd.

Virtual Learning of Engineering Students from the Low-resource environment during the Pandemic

Sasi Sekhar Mallampalli^{1,2}, Shriya Goyal¹
1: Uttaranchal University; 2: University of Petroleum and Energy Studies

1:00pm
-
2:30pm

4A: Parallel Session

Chair: Dominik May, University of Georgia

Motivation Management of Domestic and International Engineering Students in the Digital Era

Irina Makarova¹, Gulnar Nadirova², Azhar Serikkaliyeva³, Polina Buyvol¹, Vadim Mavrin¹, Eduard Mukhametdinov¹, Larisa Fatikhova¹
1: Kazan Federal University, Russian Federation; 2: Khoja Akhmet Yassawi International Kazakh-Turkish University, Eurasian Research Institute, Kazakhstan; 3: Al-Farabi Kazakh National University, Kazakhstan

Internet of Postal Things - Current Issues of Scientific Research in the University Environment

Maria Rostasova, Martin Kincl, Tatiana Corejova
University of Zilina, Slovak Republic

Simulation on Motion of A Trebuchet

Karthik Baburao Mulamuttal¹, Komal Kattigenahally Nagaraj¹, Gangadharan Kalluvalappil², Pruthvi Raj², Narasimhamurthy Kyathsandra Chandrashekar¹, Suchitra Vankalkunti¹
1: Siddaganga Institute of Technology, Tumakuru, India; 2: National Institute of Technology Karnataka, Suratkal, India

Quality Assurance for Remote-lab Systems by a New Reporting Tool

Elmissaoui Taoufik^{1,2}, Charradi Sahbi², Selmi Wafik²
1: INNOV'COM Lab, SUP'COM, University of Carthage, Tunisia; 2: University of Kairouan, Tunisia

Concept For A Teaching Medium For Immersive Forms of Teaching In Automation Technology

Jenny Schaffrath
Phoenix Contact GmbH & Co.KG, Germany

3:30pm
-

P5: Invited Talk

Chair: Doru Ursutiu, TRANSILVANIA University of Brasov - AOSR Romania

4:00pm

Easy, Engaging Robotics Education to Prepare Students for the Age of Automation and the Internet of Things

Mark Easley
Texas Instruments, United States of America

4:00pm

5A: Parallel Session

Chair: Gustavo R. Alves, ISEP

-

Work-in-Progress & Demos

5:30pm

Work-in Progress: Development of an E-learning FPGA Platform Following the IEEE SA Std. 1876 - 2019 Standard for Networked Smart Learning Objects for Online Laboratories.

Marcelo Daniel Berejuck¹, Jhennifer Cristine Matias¹, Emilio Werner¹, Hamadou Saliah-Hassane²
1: Federal University of Santa Catarina, Brazil; 2: Université TÉLUQ, Canada

LabsLand federated FPGA Remote Laboratory

Pablo Orduña¹, Luis Rodriguez-Gil¹, Cándido Aramburu², Aitor Villar-Martinez³, Shuowei Li³, Ignacio Angulo⁴, Heran Wang³, Unai Hernandez⁴, Rania Hussein³, Javier Garcia-Zubia⁴
1: LabsLand, Spain; 2: Public University of Navarre, Spain; 3: University of Washington, United States; 4: University of Deusto, Spain

Remote Experiment And Balance Between Mono-disciplinarity And Pluri-disciplinarity

Cornel Samoila^{1,2}, Doru Ursutiu^{1,3}
1: Transylvania University of Brasov -Romania, Romania; 2: Romanian Technical Science Academy; 3: Academy of Scientists of Romania

Electronic Educational Laboratory Platform for Students

Tinashe Chamunorwa¹, Doru Ursutiu^{1,2}, Cornel Samoila^{1,3}, Horia Hedesiu⁴, Horia Alexandru Modran¹
1: Transylvania University of Brasov, Romania; 2: Romanian Academy of Scientists; 3: Romanian Academy of Technical Sciences; 4: Technical University Cluj-Napoca, Romania

Automation of IoT based services using Digital Twin

Daniel Anghel, Titus Constantin Balan
"Transilvania" University of Brasov, Romania, Romania

Cloud Platform for Software Development: Review

5:45pm
-
7:15pm

6A: Parallel Session

Chair: **Alexander A Kist**, University of Southern Queensland

"Collaborative and Contextual Learning Experience, Supported in Virtual Scenarios and Software Defined Radio Tools, for the Development of a Communications Laboratory in Engineering"

Mario Andrés Ramos¹, **Paola Andrea Buitrago**^{1,2}, **Raúl Camacho**¹

1: Universidad Nacional Abierta y A Distancia - UNAD, Colombia; 2: Universidad de Medellín

Machine Learning: A Tool For Formulating Tracking Strategies Of Covid-19 Pandemic In Colombia

Hernando Vélez Sanchez, **Luini Leonardo Hurtado Cortes**

Universidad Distrital Francisco Jose de Caldas

Data Collection, Use And Transformation in Predictive Maintenance Models

Hernando Vélez Sánchez, **Luini Leonardo Hurtado Cortes**

Universidad Distrital Francisco Jose de caldas, Colombia

FPGA Meets Breadboard: Integrating a Virtual Breadboard with Real FPGA Boards for Remote Access in Digital Design Courses

Shuwei Li¹, **Heran Wang**¹, **Luis Rodriguez-Gil**², **Pablo Orduña**², **Rania Hussein**¹

1: University of Washington, United States of America; 2: LabsLand, Spain

Anzhelika Parkhomenko, **Yaroslav Zalyubovskiy**, **Andriy Parkhomenko**
National University "Zaporizhzhia Polytechnic", Ukraine

Purple Team Security Assessment Of Firmware Vulnerabilities

Lucian Florin Ilca, **Titus Constantin Balan**

"Transilvania" University of Brasov, Romania, Romania

6B: Parallel Session

Chair: **Doru Ursutiu**, TRANSILVANIA University of Brasov - AOSR Romania

Special Session: **IoT – Smart Materials and Systems**

Real-Time Monitoring of Indoor Healthcare Tracking Using the Internet of Things Based iBeacon

Mohamed Zied Chaari¹, **Abdulaziz Aljaberi**²

1: Qatar University, Qatar; 2: Qatar Scientific Club, Qatar

Monitoring Air Decontamination By Photocatalysis

Petru Epure, **Andra Perju**, **Petru P. Epure**

Epi-Sistem SRL, Romania

Localized Vineyard Monitoring For Specific Diseases

Petru Epure¹, **Andra Perju**¹, **Doru Ursutiu**^{2,4}, **Cornel Samoila**^{2,3}, **Petru P. Epure**¹

1: Epi-Sistem SRL, Romania; 2: Transilvania University of Brasov; 3: Academia de Stiinte Tehnice din Romania; 4: Academia Oamenilor de Stiinta

Artificial Intelligence System for predicting cardiovascular diseases using IoT devices and Virtual Instrumentation

Horia Alexandru Modran¹, **Doru Ursutiu**^{1,2}, **Cornel Samoila**^{1,3}, **Tinashe Chamunorwa**¹

1: Transilvania University of Brasov, Romania; 2: Romanian Academy of Scientists; 3: Romanian Academy of Technical Sciences

Automated Testing of GUI Based Communication Elements

Andreea Cristiana Nica, **Alexandra Balan**, **Corneliu Zaharia**, **Titus Constantin Balan**

Transilvania University of Brasov, Romania

7:15pm
-
7:45pm

Closing Session

Chair: **Kalyan Ram Bhimavaram**, Electrono Solutions Pvt Ltd

- iJOE Outstanding Paper Award
- Best Paper Awards
- Invitation for REV2022