

SEST'21

4th International Conference on Smart
Energy Systems and Technologies

6-8 September 2021



Vaasan yliopisto
UNIVERSITY OF VÅASA



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Smart Energy Systems and Technologies
(SEST 2021)





Welcome Message

On behalf of all chairs and program committee members, I am honored to welcome you to 4th International Conference on Smart Energy Systems and Technologies – SEST 2021.

The SEST conference series is determined to establish itself as the venue to present top-tier scientific research in the field of Smart Energy Systems and Technologies. I would like to use this opportunity to acknowledge the exceptional contributions of all TPC members and all chairs, whose efforts were pivotal in helping make this vision a reality. The TPC carried out a comprehensive three-level review process of all submitted technical papers:


-1st Stage: Abstracts were assessed regarding scope and quality/interest, with **18%** of those abstracts have been rejected (75 abstracts). The authors of the remaining abstracts have been invited to submit the corresponding full paper.

-2nd Stage: Full papers were thoroughly evaluated by **128** TPC members and **761** external reviewers, averaging **5.7** reviews per paper.

-3rd Stage: Revised full papers (and the response letters) were also evaluated by the conference chairs.

Overall, **425** abstracts were initially submitted (from 54 countries and all 5 continents), and **124** full papers were finally accepted to be presented. The final acceptance rate this year was **39%**.





This rigorous review process would not have been possible if not for the tremendous efforts of TPC members and all **761** external reviewers, whose contributions significantly improved the quality of the papers to be presented in technical sessions.

Finally, we also have the privilege of having six outstanding Keynote Speakers, all world-renowned experts in the field, who will be presenting keynote addresses on the most pressing and timely topics.

The health and safety of our participants are of the utmost importance for the SEST 2021 organizing committee. Hence, due to the COVID-19 situation, SEST 2021 is held virtually this year. We aim at providing an opportunity to discuss various engineering challenges of smart energy system design and operation by focusing on advanced methods and practices for designing different components and their integration within modern and next-generation grids. We also hope to provide a forum for researchers from academia and professionals from industry, as well as government regulators to tackle these challenges, and discuss and exchange knowledge and best practices about design and implementation of smart energy systems.

I hope that you will enjoy this year's SEST conference with its high-quality papers and outstanding keynote presentations. Thank you very much!

Miadreza Shafie-khah
SEST 2021 General Chair

On Behalf of all Chairs



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Sest' 21

4th International Conference on
Smart Energy Systems and
Technologies (SEST)

6-8 September 2021



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Conference Program

	CEST	Day 1 06/09/2021	Day 2 07/09/2021	Day 3 08/09/2021
Morning Sessions	9:30 - 10:00	Opening Session	Panel Session: <i>EMPOWER project</i>	Panel Session: <i>VPP4Islands project</i>
	10:00 - 11:30	Session 1	Session 6	Session 11
	11:30 - 12:00	Break	Break	Break
	12:00 - 13:30	Session 2	Session 7	Session 12
	13:30 - 14:00	Break	Break	Break
Keynote Sessions	14:00 - 14:45	<i>Keynote 1: Carlo Alberto Nucci</i>	<i>Keynote 3: Joydeep Mitra</i>	<i>Keynote 5: Claudio Canizares</i>
	14:45 - 15:30	<i>Keynote 2: Frede Blaabjerg</i>	<i>Keynote 4: Badrul Chowdhury</i>	<i>Keynote 6: Bikash Pal</i>
Afternoon Sessions	15:30 - 17:00	Session 3	Session 8	Session 13
	17:00 - 17:30	Break	Break	Break
	17:30 - 19:00	Session 4	Session 9	Session 14
	19:00 - 19:30	Break	Break	Break
	19:30 - 21:00	Session 5	Session 10	Closing & Awards Session

Conference Venue

The health and safety of our participants are of the utmost importance for the SEST 2021 organizing committee. Hence, due to the COVID-19 situation, which still poses a lot of concerns and uncertainty worldwide, SEST 2021 will be held virtually. Please use the following links to access the conference sessions:

Guidelines:

The conference will use **Zoom** platform. We recommend that you install the Zoom client: <https://zoom.us/support/download>. If it is not possible to install this client, then you can use the HTML Web client. You can **test** if you can access a Zoom meeting via <https://zoom.us/test>. The **audio** for this conference is delivered through your computer. Before joining the conference, make sure to have your headset and microphone connected. Having a webcam can increase the interactivity but is not strictly necessary.

Presenting authors must be present in the session **at least 10 minutes before the start of the session**. Be ready to answer questions from the participants and the session chairs after your MP4 video or PPT slides are presented. Session chairs will announce and manage the Q&A period. **Participants** are invited to join and leave any session whenever they want. If you wish to ask a question, please type your question in the Chat window. Non-presenting authors must have the microphone **muted** during the presentations period.

Zoom Links:

Day 1 - 06/09/2021

SEST 2021 – **Morning Sessions (Opening Session + Session 1 + Session 2)**, 9:30 – 13:30 CEST

<https://uwasa.zoom.us/j/67616187022?pwd=ZTFHTzIKRDhmVmZOMIJXaXV1UG9HZz09>

ID: 67616187022

Pass: SEST21D1M

SEST 2021 – **Keynote Sessions (Keynotes Profs. Nucci and Blaabjerg)**, 14:00 – 15:30 CEST

<https://uwasa.zoom.us/j/65329221403?pwd=cVhUS0pzVldpUG9HT0dQUHU4YisvQT09>

ID: 65329221403

Pass: SEST21D1K

SEST 2021 – **Afternoon Sessions (Session 3 + Session 4 + Session 5)**, 15:30 – 21:00 CEST

<https://uwasa.zoom.us/j/61240736724?pwd=NVMxNjlzQkIyMStyVXB5bUtDeE9iUT09>

ID: 61240736724

Pass: SEST21D1A

Day 2 - 07/09/2021

SEST 2021 – Morning Sessions (Panel Session + Session 6 + Session 7), 9:30 – 13:30 CEST

<https://uwasa.zoom.us/j/62567173214?pwd=WGFaHRpaNdlRUlMREhmMmFMUUt4Zz09>

ID: 62567173214

Pass: SEST21D2M

SEST 2021 – Keynote Sessions (Keynotes Profs. Mitra and Chowdhury), 14:00 – 15:30 CEST

<https://uwasa.zoom.us/j/68210082637?pwd=Z0ZPUXYxMXZrRVJNZ1ZSY2ZTcUM0dz09>

ID: 68210082637

Pass: SEST21D2K

SEST 2021 - Afternoon Sessions (Session 8 + Session 9 + Session 10), 15:30 – 21:00 CEST

<https://uwasa.zoom.us/j/66046241713?pwd=Ulk1TTNXMTZueUZNBG9ZWWhON21Ddz09>

ID: 66046241713

Pass: SEST21D2A

Day 3 - 08/09/2021

SEST 2021 - Morning Sessions (Panel Session + Session 11 + Session 12), 9:30 – 13:30 CEST

<https://uwasa.zoom.us/j/66631525057?pwd=dFJJEVFFSeDFTdTq5cEdSck9WR0xKZz09>

ID: 66631525057

Pass: SEST21D3M

SEST 2021 - Keynote Sessions (Keynotes Profs. Canizares and Pal), 14:00 – 15:30 CEST

<https://uwasa.zoom.us/j/64657829021?pwd=bEFEWEIJUFoyV2Z1LzhjRFFxbGc1Zz09>

ID: 64657829021

Pass: SEST21D3K

SEST 2021 - Afternoon Sessions (Session 13 + Session 14 + Closing and Awards Session), 15:30 – 21:00 CEST

<https://uwasa.zoom.us/j/64985149307?pwd=S3ZaZ1VHV0FNbkdzVEVqKzRaZkZz09>

ID: 64985149307

Pass: SEST21D3A

Important Information

Overall, there will be 124 paper presentations, which have been grouped into 14 sessions to ensure the best opportunities for attendees with different interests.

No parallel sessions are envisaged this year; therefore, authors are able to attend all sessions.

Sessions have a total duration of 90 minutes. Presenting authors should be at their designated virtual room at least 15 minutes prior to the session. The duration of each presentation should not exceed 8 minutes, followed by around 2 minutes of Q&A and discussion.

Every day, two consecutive keynote addresses will take place, also having a total duration of 90 minutes. Each keynote address will have a duration of about 40 minutes, followed by 5 minutes of Q&A and discussion.

*With Technical co-sponsorship by IEEE, IEEE PES, IEEE IES, IEEE IAS, and IEEE PELS, the **top 20%** of accepted and presented **papers in SEST 2021** will be eligible for publication in **IEEE Transactions on Industry Applications**, and **50%** top papers will be eligible for further review to be published in the journal **Sustainable Energy, Grids and Networks (SEGAN)**, **Elsevier**, provided that the content follows the main scopes of SEGAN.*



List of Keynote Addresses

Day 1:

"Towards Climate Neutrality and Smart Cities: the Contribution of Energy Communities"

- Carlo Alberto Nucci

"Power Electronics Technology - Quo Vadis"

- Frede Blaabjerg

Day 2:

"Energy Assurance with Renewable Generation"

- Joydeep Mitra

"Solar/Wind+Energy Storage: Strategies and Use Cases"

- Badrul Chowdhury

Day 3:

"Energy Storage Overview and Research"

- Claudio Canizares

"Robust Volt-Var Control in Power Distribution"

- Bikash Pal



Day 1: Carlo Alberto Nucci

“Towards Climate Neutrality and Smart Cities: the Contribution of Energy Communities”



Bio: Carlo Alberto Nucci graduated with honors in electrical engineering from the University of Bologna, Bologna, Italy, in 1982. He is a Full Professor and Head of the Power Systems Laboratory of the Department of Electrical, Electronic and Information Engineering “Guglielmo Marconi”, University of Bologna. He is an author or coauthor of over 370 scientific papers published in peer-reviewed journals or in proceedings of international conferences. Prof. Nucci is a Fellow of the IEEE and of the International Council on Large Electric Systems (CIGRE), of which he is also an Honorary member, and has received some best paper/technical international awards, including the CIGRE Technical Committee Award and the ICLP Golde Award. From January 2006 to September 2012, he served as Chairman of the CIGRE Study Committee C4 “System Technical Performance”. He has served as IEEE PES Region 8 Rep in 2009 and 2010. Since January 2010, he has served as Editor-in-Chief of the Electric Power Systems Research journal (Elsevier). He has served as the President of the Italian Group of the University Professors of Electrical Power Systems (GUSEE) from 2012 to 2015. He is an Advisor of the Global Resource Management Program of Doshisha University, Kyoto, Japan, supported by the Japanese Ministry of Education and Science, and has represented PES in the IEEE Smart City Initiatives Program since 2014. Prof. Nucci is Doctor Honoris Causa of the University Politehnica of Bucharest and a member of the Academy of Science of the Institute of Bologna.



Day 1: Frede Blaabjerg

“Power Electronics Technology - Quo Vadis”



Bio: Frede Blaabjerg was with ABB-Scandia, Randers, Denmark, from 1987 to 1988. From 1988 to 1992, he got the PhD degree in Electrical Engineering at Aalborg University in 1995. He became an Assistant Professor in 1992, an Associate Professor in 1996, and a Full Professor of power electronics and drives in 1998. From 2017 he became a Villum Investigator. He is honoris causa at University Politehnica

Timisoara (UPT), Romania and Tallinn Technical University (TTU) in Estonia.

His current research interests include power electronics and its applications such as in wind turbines, PV systems, reliability, harmonics and adjustable speed drives. He has published more than 600 journal papers in the fields of power electronics and its applications. He is the co-author of four monographs and editor of ten books in power electronics and its applications.

He has received 33 IEEE Prize Paper Awards, the IEEE PELS Distinguished Service Award in 2009, the EPE-PEMC Council Award in 2010, the IEEE William E. Newell Power Electronics Award 2014, the Villum Kann Rasmussen Research Award 2014, the Global Energy Prize in 2019 and the 2020 IEEE Edison Medal. He was the Editor-in-Chief of the IEEE TRANSACTIONS ON POWER ELECTRONICS from 2006 to 2012. He has been Distinguished Lecturer for the IEEE Power Electronics Society from 2005 to 2007 and for the IEEE Industry Applications Society from 2010 to 2011 as well as 2017 to 2018. In 2019-2020 he served as a President of IEEE Power Electronics Society. He has been Vice-President of the Danish Academy of Technical Sciences.

He is nominated in 2014-2020 by Thomson Reuters to be between the most 250 cited researchers in Engineering in the world.

Day 2: Joydeep Mitra

“Energy Assurance with Renewable Generation”



Bio: Joydeep Mitra (Ph.D., FIEEE) is MSU Foundation Professor of Electrical Engineering at Michigan State University, East Lansing, Director of the Energy Reliability & Security (ERiSe) Laboratory, and Senior Faculty Associate at the Institute of Public Utilities. He received a Ph.D. in Electrical Engineering from Texas A&M University, College Station, and a B.Tech.(Hons.) in Electrical Engineering from Indian Institute of Technology, Kharagpur. Prof. Mitra has conducted research in power system modeling, analysis, stability, control, planning and simulation, and is known for his contributions to power system reliability analysis and reliability-based planning. He has over 200 publications and patents in the power systems area; he is co-author of the book, “Electric Power Grid Reliability Evaluation: Models and Methods,” and of IEEE Standard 762, a standard on reliability reporting. He is recipient of the 2020 Merit Award from the International Society for Probabilistic Methods Applied to Power Systems (PMAPS) and the 2019 IEEE-PES Roy Billinton Power System Reliability Award. Prof. Mitra’s research has been funded by the U.S. National Science Foundation, the U.S. Department of Energy, U.S. National Laboratories, and several electric utilities. Prof. Mitra is a Fellow of the IEEE. He serves as an Associate Editor for the IEEE Transactions on Industry Applications. In the past he has served as Chair of the IEEE-PES Analytic Methods for Power Systems Committee, Chair of several IEEE-PES Subcommittees, and as an Editor for the IEEE Transactions on Power Systems and Power Engineering Letters, and for the IEEE Transactions on Smart Grid. Prof. Mitra engages actively in several IEEE activities such as organizing conference tracks and contributing to the development of IEEE standards.

Day 2: Badrul Chowdhury

“Solar/Wind+Energy Storage: Strategies and Use Cases”



Bio: Badrul Chowdhury is a Professor in Electrical & Computer Engineering with joint appointment in Systems Engineering & Engineering Management at the University of North Carolina at Charlotte. He received his PhD in Electrical Engineering from Virginia Tech, Blacksburg, VA, and his B.S degree also in Electrical Engineering from Bangladesh University of Engineering Technology, Dhaka, Bangladesh.

Dr. Chowdhury’s research interests are in power system modeling, analysis, control and economics; integration of renewable and distributed energy resources including wind electric conversion systems, solar PV, and energy storage in a smart grid environment; microgrid control and optimization.

He is currently serving as the Assistant Director of the Energy Production and Infrastructure Center (EPIC) at UNCC, and Site Director for the Center for Advanced Power Engineering Research (CAPER).

Dr. Chowdhury is the Chair of the Charlotte Chapter of IEEE PES. He is the Chair of the PES Photovoltaics Working Group and past chair of the PES University Education subcommittee. He is the current Editor-in-Chief of the IEEE Transactions on Sustainable Energy.

Day 3: Claudio Canizares

“Energy Storage Overview and Research”



Bio: Dr. Claudio Cañizares is a University Professor and the Hydro One Endowed Chair at the Electrical and Computer Engineering (E&CE) Department of the University of Waterloo, where he has held various academic and administrative positions since 1993. He received the Electrical Engineer degree from the Escuela Politécnica Nacional (EPN) in Quito-Ecuador in 1984, where he held different academic and administrative positions between 1983 and 1993, and his MSc (1988) and PhD (1991) degrees in Electrical Engineering are from the University of Wisconsin-Madison. His research activities focus on the study of stability, control, optimization, modeling, simulation, and computational issues in bulk power systems, microgrids, and energy systems in the context of competitive energy markets and smart grids. In these areas, he has led or been an integral part of many grants and contracts from government agencies and private companies worth millions of dollars, and has collaborated with multiple industry and university researchers in Canada and abroad, supervising/co-supervising over 170 research fellows and graduate students. He has authored/co-authored over 350 publications with over 24,000 citations and 70 H-index, including journal and conference papers, technical reports, book chapters, disclosures and patents, and has been invited to deliver keynote speeches, seminars, tutorials, and presentations at many institutions and conferences worldwide. He is the Editor-In-Chief of the Institute of Electrical & Electronic Engineering (IEEE) Transactions on Smart Grid, the 2021-2023 IEEE Division VII Director-Elect and Director of the IEEE and Power & Energy Society (PES) Boards, and a Fellow of the IEEE, a Fellow of the Royal Society of Canada, where he was the Director of the Applied Science and Engineering Division of the Academy of Science from 2017 to 2020, and a Fellow of the Canadian Academy of Engineering. He is also the recipient of the 2017 IEEE PES Outstanding Power Engineering Educator Award, the 2016 IEEE Canada Electric Power Medal, and of multiple IEEE PES Technical Council and Committee awards and recognitions, holding leadership positions in several IEEE-PES Committees, Working Groups, and Task Forces.



Day 3: Bikash Pal

“Robust Volt-Var Control in Power Distribution”



Bio: Bikash Pal is a Professor of Power Systems at Imperial College London (ICL). He is research active in power system stability, control, and estimation. Currently is leading a six university UK-China research consortium on Resilient Operation of Sustainable Energy Systems (ROSES) as part of EPSRC-NSFC Programme on Sustainable Energy Supply. He led UK-China research consortium project on Power network stability with grid scale storage (2014-2017): He also led an eight- university UK-India research consortium project (2013-2017) on smart grid stability and control. His research is conducted in strategic partnership with ABB, GE Grid Solutions, UK, and National Grid, UK. UK Power Networks. GE commissioned sequel of projects with him to analyse and solve wind farm HVDC grid interaction problems (2013-2019). Prof Pal was the chief technical consultant for a panel of experts appointed by the UNFCCC CDM (United Nations Framework Convention on Climate Change Clean Development Mechanism). He has offered trainings in Chile, Qatar, UAE, Malaysia and India in power system protections, stability and control topics. He has developed and validated a prize winning 68-bus power system model, which now forms a part of IEEE Benchmark Systems as a standard for researchers to validate their innovations in stability analysis and control design. He was the Editor-in-Chief of IEEE Transactions on Sustainable Energy (2012-2017) and Editor-in-Chief of IET Generation, Transmission and Distribution (2005-2012). He is Vice President, PES Publications (2019-). In 2016, his research team won the President's outstanding research team award at Imperial College London (ICL). He is Fellow of IEEE for his contribution to power system stability and control. He is an IEEE Distinguished Lecturer in Power distribution system estimation and control. He was). He has published about 100 papers in IEEE Transactions and IET journals and authored four books in power system modelling, dynamics, estimations and control. Two of his papers in power system stability and control topics have received annual best journal paper award. He was Otto Monstead Professor at Denmark Technical University (DTU) (2019) and Mercator Professor sponsored by German Research Foundation (DFG) at University of Duisburg-Essen in 2011. He worked as faculty at IIT Kanpur, India. He holds a Visiting Professorship at Tsinghua University, China.

List of Panel Sessions

Day 2: EMPOWER Project

“Modernize the Cyprus power system by integrating synchrophasor technology and flexible energy storage solutions”

Speakers:

Markos Asprou, Lenos Hadjidemetriou, Panayiotis Demetriou

Abstract: Towards a climate neutral economy, a massive deployment of renewable resources is needed to decarbonize the energy system. However, the unpredicted nature of renewable energy imposes critical operational challenges to the energy infrastructure and therefore, digital and flexible technologies should be integrated into the future power systems to enhance the operational capabilities of the operators. To this end, EMPOWER project aims to modernize the Cyprus power system with cutting edge solutions based on synchrophasor technology in digital substations and on energy storage systems provisioning novel ancillary services.

In particular, the EMPOWER project upgrades the measurement infrastructure of the Cyprus power system through the deployment of Phasor Measurement Units (PMUs). The integration of synchrophasor technology enables the full observability of the Cyprus transmission power grid by synchronized measurements, allowing the development of innovative real-time monitoring and control tools for the system operator. On the other hand, three pilots with energy storage systems considering batteries and flywheels are currently developed within the EMPOWER project to facilitate the green transition of energy systems. In these pilots, a holistic multi-level hierarchical control framework is developed considering multi-functional operational capabilities by the grid tied inverters to advance the integration of renewable resources in different smart grid applications. This presentation will highlight the key results achieved by the project and the lessons learned so far for both the synchrophasor and energy storage applications.

Day 3: VPP4Islands Project

“Virtual Power Plant for Interoperable and Smart Islands”

Speakers:

Seifeddine Ben Elghali, Ehsan Heydarian-Forushani

Abstract: The ambition of EU H2020 funded VPP4Islands is to become the leader of Island decarbonisation and VPP development that promotes decentralized and sustainable energy systems through open innovative tools and concepts while considering the island challenges, infrastructures and implementation costs. In order to mitigate uncertainties that are inherent in renewable energy sources, VPP4Islands will be able to create flexible and interoperable VPPs that can be integrated more easily with existing grid systems without negatively impacting stability.

The VPP4I Platform is a data and information service provider. It will collect data and information from real-time measurements of the physical systems (e.g. generation output, demand, voltage and current of the network), information on surrounding environment (e.g. price signals, weather info), and VPP Shadow; process such data and information using advanced software tools, e.g. machine learning, in order to provide an accurate and coherent data and information set for facilitating better decision making of the participants. It is not a data and service provider rather than a centralised operational centre. It will have a clear strategy on the data transparency and privacy. Moreover, this platform makes use of the digital twin concept which will combine the virtual and physical worlds together to make better decisions, reduce risks and perform forecasting.

Conference Sessions

SESSION 1 (Mon, Sep 6th 2021) Power System Planning

Time: 10:00 – 11:30 (CEST)

Chair: Ozan Erdinç

316	Optimal Placement of Renewable Energy Sources Distributed Generation in an Unbalanced Distribution Network for Modern Grid Operations <i>Ifedayo Oladeji, Ramon Zamora and Tek Tjing Lie</i>
331	Allocation of FCLs in Transmission Networks with High Penetration of DGs: A Two-Stage Approach <i>Mohammad Amin Jarrahi, Farzad Roozitalab, Mohammad Mehdi Arefi, Mohammad Sadegh Javadi and João P.S. Catalão</i>
377	Optimal Utilisation of Grid Capacity for Connection of New Renewable Power Plants in Norway <i>Viljar Stensaker Stave, Marthe Fogstad Dyngre, Hossein Farahmand, Magnus Korpås and Ümit Cali</i>
80	An open source tool for approximate analytical reliability analysis in radial distribution grids <i>Sigurd Hofsmo Jakobsen, Michele Garau and Olve Mo</i>
160	Transmission Expansion Planning using a Highly Accurate AC Optimal Power Flow Approximation <i>Otto Heide, Karlo Šepetanc and Hrvoje Pandžić</i>
185	Optimization-Based Distribution System Reliability Evaluation: An Enhanced MILP Model <i>Mohammad Jooshaki, Matti Lehtonen, Mahmud Fotuhi-Firuzabad, Gregorio Muñoz-Delgado, Javier Contreras and José M. Arroyo</i>
196	A Multi-Terminal HVDC Demonstration Grid in the North Sea: A Cost-Effective Option <i>Chandra Kant Jat, Jay Dave, Hakan Ergun and Dirk Van Hertem</i>
349	Coordination of Aggregators for Flexibility Provision: A Conceptual Framework <i>Cesar Diaz-Londono, Carlos Adrian Correa-Florez, Jose Vuelvas, Andrea Mazza, Fredy Ruiz and Gianfranco Chicco</i>
337	Cross-border Shared Sizing of Frequency Restoration Reserves: Insights from the H2020 CROSSBOW Project <i>Panagiotis Pediaditis, Dimitrios Papadaskalopoulos, Nikos Hatzigiorgiou and Dušan Prešić</i>

SESSION 2 (Mon, Sep 6th 2021) Electricity Markets

Time: 12:00 – 13:30 (CEST)

Chair: Nikolaos Paterakis

343	High-Performance Data Analytics Techniques for Power Markets Simulation <i>Juraj Kardoš, Timothy Holt, Olaf Schenk, Vincenzo Fazio, Luca Fabietti and Filippo Spazzini</i>
33	Reactive Power Market Demonstration <i>Pirjo Heine, Atte Pihkala, Suvi Takala and Sergio Motta</i>
390	Hybrid AC/DC Optimal Power Flow Modelling Approach for Coordination in Flexibility Market <i>Ole Kjærland Olsen, Damian Sieraszewski, Dmytro Ivanko, Irina Oleinikova and Hossein Farahmand</i>
34	A multiagent framework to model the interactions of local energy communities and power systems <i>Inês F.G. Reis, Ivo Gonçalves, Carlos Henggeler Antunes and Marta A.R. Lopes</i>
239	Mathematical Model for Agent-based Local Energy Exchange Engine (D3A) <i>Amin Shokri Gazafroudi, Godwin C. Okwuibe, Sarah Hambridge, Christopher Dietrich, Ana Trbovich, Peter Tzscheutschler, Thomas Hamacher and Mladreza Shafie-khah</i>
243	Optimal Scheduling of Commercial Demand Response by Technical Virtual Power Plants <i>Matthew Gough, Sérgio F. Santos, João M.B.A. Matos, Juan M. Home-Ortiz, Mohammad S. Javadi, Rui Castro and João P.S. Catalão</i>
125	Optimal Participation of RES Aggregators in Electricity Markets Under Main Imbalance Pricing Mechanisms <i>Ilias G. Marnieris, Andreas V. Ntomaris, Pandelis N. Biskas and Anastasios G. Bakirtzis</i>
383	Optimal Strategy of Energy Storage Aggregators in Ancillary Service Markets: Stochastic Programming Approach <i>Meysam Khojasteh, Pedro Faria, Fernando Lezama and Zita Vale</i>
369	Blockchain-Enabled Equity Crowdfunding for Energy Storage Investments <i>Umit Cali, Ugur Halden, Marthe Fogstad Dyrnge and Aleksandra-Sasa Bukvic-Schaefer</i>

SESSION 3 (Mon, Sep 6th 2021) Electric Mobility

Time: 15:30 – 17:00 (CEST)

Chair: Ozan Erdiņ

77	<p>Efficient Online Scheduling of Electric Vehicle Charging Using a Service-Price Menu <i>Angeliki Mathioudaki, Georgios Tsaousoglou, Emmanouel Varvarigos and Dimitris Fotakis</i></p>
205	<p>Avoiding Low-Voltage Grid Congestion using Smart Charging of Electric Vehicles based on Day-Ahead Probabilistic Photovoltaic Forecasts <i>Nico Brinkel, Lennard Visser, Tarek AlSkaif and Wilfried van Sark</i></p>
56	<p>A Smart Charging Algorithm Considering Multiple Revenue Opportunities <i>Nico Pieper, Tom Warendorf and Johanna Myrzik</i></p>
63	<p>Heavy-duty electric vehicle charging profile generation method for grid impact analysis <i>Kyrre Kirkbakk Fjær, Venkatachalam Lakshmanan, Bendik Nybakk Torsæter and Magnus Korpås</i></p>
92	<p>Commutation Angle Maps Evaluation for Magnet Arrangements of Interior Permanent Magnet Synchronous Machines in Electric Vehicles <i>Pedram Asef, Mouloud Denai, Bruno Ricardo Marques, Johannes J. H. Paulides and Andrew Laphorn</i></p>
334	<p>Plug-in Electric Vehicle Load Modeling for Smart Charging Strategies in Microgrids <i>Iven Guzel and Murat Göl</i></p>
392	<p>Modeling and Simulation of Electric Vehicle Flexibility to Support the Local Network <i>Mohammed Hijjo and Anna-Lena Klingler</i></p>
249	<p>Energy Management of a Port Serving Fuel Cell and Battery Based Hybrid Green Ferries <i>Hilal Özdemir, Hilmi Cihan Güldorum, Ozan Erdiņ and İbrahim Şengör</i></p>
85	<p>Adaptive Gain Tuning of Onboard Chargers to Mitigate Parameter Uncertainty in V2G Interfaces <i>Khalil Sinjari, Saad Alzahrani and Joydeep Mitra</i></p>

SESSION 4 (Mon, Sep 6th 2021) Power Electronic Systems & Applications

Time: 17:30 – 19:00 (CEST)

Chair: Hossein Hafezi

40	Integration Design of Sub-Module for Medium Voltage Modular Multilevel Converter <i>Vegard Steinsland, Eirik Haustveit, Endre Håland and Shujun Zhang</i>
101	New High Step-Up Coupled Dual Winding Quadratic Enhanced SEPIC DC-DC Converter <i>Soroush Esmaeili, Sara Hasanpour and Hossein Hafezi</i>
214	Advanced Control of DC Grid-Connected Proton Exchange Membrane Fuel Cell: A Linear Parameter Varying Approach <i>Amir Afsharinejad, Maryam Dehghani, Mohammad H. Asemani, Navid Vafamand, Mohammad S. Javadi, Fei Wang and João P.S. Catalão</i>
256	Circuit Configuration of a Sensorless Multilevel Inverter with Voltage Multiplying Ability <i>Erfan Azimi, Aryorad Khodaparast and Hossein Hafezi</i>
286	Control Algorithm Extension for Series Power Electronic Converter <i>Kishore Akkala, Roberto Faranda, Pierfrancesco Sodini and Giambattista Gruosso</i>
303	A Single-Switch Ultra-High Gain DC-DC Converter with Low Input Current Ripple and ZCS <i>Mohammad Farsijani, Sohrab Abbasian, Hossein Hafezi, Mohammad Tavakolibina and Karim Abbaszadeh</i>
414	A Novel Multilevel Solid-State Transformer for Hybrid Power Grids <i>Vitor Monteiro, Delfim Pedrosa, Sergio Coelho, Tiago Sousa, Luis Machado and Joao L. Afonso</i>
415	Model Predictive Control of a Single-Phase Five-Level VIENNA Rectifier <i>Vitor Monteiro, Catia Oliveira, Tiago Sousa and Joao L. Afonso</i>
128	A Novel Single-Phase Triple-Output Active Buck Rectifier Using Nine-Level Packed E-Cell Converter <i>Mohammad Babaie and Kamal Al-Haddad</i>

SESSION 5 (Mon, Sep 6th 2021) Distributed Energy Resources

Time: 19:30 – 21:00 (CEST)

Chair: Mohammad Javadi

86	Energy Storage Sizing Based on Automatic Frequency Restoration Reserve Market Participation of Hybrid Renewable Power Plants <i>Jon Martínez-Rico, Ismael Ruiz de Argandoña, Ekaitz Zulueta, Unai Fernández-Gamiz and Mikel Armendia</i>
97	PV Hosting Capacity Improvement Through an Aggregate Study of Single-tuned Passive Filter Planning and Grid Reconfiguration <i>Ehsan Kazemi-Robati, Hossein Hafezi and Mohammad Sadegh Sepasian</i>
339	Energy Management in Converter-Interfaced Renewable Energy Sources Through Ultracapacitors for Provision of Ancillary Services <i>Andrei Mihai Gross, Kyriaki-Nefeli Malamaki, Manuel Barragán-Villarejo, Georgios C. Karyonidis, Francisco Jesús Matas-Díaz, Spyros I. Gkavanoudis, Juan Manuel Mauricio, José María Maza-Ortega and Charis S. Demoulias</i>
26	Ramp-Rate Control of DRES employing Supercapacitors in Distribution Systems <i>Kyriaki-Nefeli D. Malamaki, Francisco Casado-Machado, Manuel Barragán-Villarejo, Andrei Mihai Gross, Georgios C. Karyonidis, Jose L. Martinez-Ramos and Charis S. Demoulias</i>
88	Comparing Disturbance-based Methods for Inertia Estimation in the island of São Vicente, Cape Verde <i>Dominique Alonso Sørensen and Esther Torres Iglesias</i>
238	FESS for Reliability Improvement of DER-based Microgrids: Comparison of Distributed Storage Alternatives <i>Abir Muhtadi, Dilip Pandit, Nga Nguyen, Salem Elsaiah and Joydeep Mitra</i>
225	Reliability Evaluation of Solar PV System Incorporating Insolation-Dependent Failure Rates <i>Dilip Pandit, Nga Nguyen, Salem Elsaiah and Joydeep Mitra</i>
217	Sizing Storage for Mitigating Frequency Stability Issues of Wind Integrated Systems <i>Atri Bera and Joydeep Mitra</i>
353	A Comprehensive Building Load Optimization Method from Utility Rate Structure Perspective with Renewables and Energy Storage <i>A S M Jahid Hasan, Luis Fernando Enriquez-Contreras, Jubair Yusuf and Sadrul Ula</i>

SESSION 6 (Tue, Sep 7th 2021) Multi-energy Systems

Time: 10:00 – 11:30 (CEST)

Chair: Mohammad Javadi

111	<p>A Coordinated Operation Model for Multiple Community Integrated Energy Systems and Hybrid Distribution System Based on Hierarchical Decentralized Scheduling <i>Chenlu Mu, Tao Ding, Ziyu Zeng, Yuge Sun, Lanfen Cheng and Xiangrui Su</i></p>
132	<p>Bi-level Two-stage Stochastic Operation of Hydrogen-based Microgrids in a Distribution System <i>Mohammad H. Shams, Mohammad MansourLakouraj, Jay J. Liu, Mohammad Sadegh Javadi and João P.S. Catalão</i></p>
209	<p>Optimal Cooperative Scheduling of Multi-Energy Microgrids Under Uncertainty <i>Matija Kostelac, Lin Herenčić and Tomislav Capuder</i></p>
20	<p>A Cost-Driven Smart Heat Recovery Control for Supermarket Refrigeration System Coupled with District Heating System <i>Chunjun Huang, Yi Zong, Shi You, Jan Eric Thorsen and Lars Finn Sloth Larsen</i></p>
115	<p>Optimal Dimensioning of Power-to-Gas Units in the Context of Integrated Power and Gas Grid Planning in Distribution Grids <i>Joshua Jakob, Tobias Riedlinger, Robert Schmidt, James Garzon-Real, Markus Zdrallek, Johannes Ruf, Wolfgang Köppel and Silas Reigardt</i></p>
138	<p>Energy Hub Design in the Presence of P2G System Considering the Variable Efficiencies of Gas-Fired Converters <i>Seyed Amir Mansouri, Amir Ahmarinejad, Emad Nematbakhsh, Mohammad Sadegh Javadi, Ahmad Rezaee Jordehi and João P.S. Catalão</i></p>
215	<p>Multi-Energy Planning of Urban District Retrofitting <i>Alessandro Sebastiano Carrus, Marco Galici, Emilio Ghiani, Luigi Mundula and Fabrizio Pilo</i></p>
194	<p>Smart Island Energy Systems: Case Study of Ballen Marina on Samsø <i>Dawid Jozwiak, Jayakrishnan Radhakrishna Pillai, Pavani Ponnaganti, Birgitte Bak-Jensen and Jan Jantzen</i></p>

SESSION 7 (Tue, Sep 7th 2021) Forecasting

Time: 12:00 – 13:30 (CEST)

Chair: Akın Taşçıkaraoğlu

148	<p>A New Ensemble Reinforcement Learning Strategy for Solar Irradiance Forecasting using the Deep Optimized Convolutional Neural Network Models <i>Seyed Mohammad J. Jalali, Mahdi Khodayar, Sajad Ahmadian, Miadreza Shafie-Khah, Abbas Khosravi, Syed Mohammed S. Islam, Saeid Nahavandi and João P. S. Catalão</i></p>
187	<p>Monthly Net Electricity Consumption Prediction under High Penetration of Distributed Photovoltaic System <i>Xin Chen, Zhenghui Li, Fei Wang, Kangping Li and João P.S. Catalão</i></p>
220	<p>Adaptive in-situ forecasting for demand-side management in low voltage power grids <i>Christian Backe, Miguel Bande, Stefan Werner and Christian Wieszorek</i></p>
5	<p>Multi-Horizon Data-Driven Wind Power Forecast: From Nowcast to 2 Days-Ahead <i>Daniel Vázquez Pombo, Tuhfe Göçmen, Kaushik Das and Poul Sørensen</i></p>
17	<p>Scenario Based Probabilistic Energy Demand Forecasting using Autoencoders and Gaussian Mixture Models <i>Theodoros Konstantinou, Nikolaos Savvopoulos and Nikos Hatzigiorgyriou</i></p>
31	<p>Comparison of intraday probabilistic forecasting of solar power using time series models <i>Oliver Doelle, Ileskhan Kalysh, Arvid Amthor and Christoph Ament</i></p>
47	<p>Generating scenarios from probabilistic short-term load forecasts via non-linear Bayesian regression <i>Markus Löschenbrand, Sébastien Gros and Venkatachalam Lakshmanan</i></p>
311	<p>Deep Convolutional Graph Rough Variational Auto-Encoder for Short-Term Photovoltaic Power Forecasting <i>Mohsen Saffari, Mahdi Khodayar, Seyed Mohammad Jafar Jalali, Miadreza Shafie-Khah and João P.S. Catalão</i></p>
327	<p>Time-Series Analysis and Forecasting of Power Consumption using Gaussian Process Regression <i>Marcel Zimmer, Thiemo Pesch and Andrea Benigni</i></p>

SESSION 8 (Tue, Sep 7th 2021) Power System Operation I

Time: 15:30 – 17:00 (CEST)

Chair: Gerardo Osório

35	Contribution of Residential PV and BESS to the Operational Flexibility at the TSO-DSO Interface <i>Nikolaos Savvopoulos, C. Yaman Evrensoğlu, Theodoros Konstantinou, Turhan Demiray and Nikos Hatzigiorgiou</i>
259	Uncertainty-Aware Decision Making in Power Systems Including Energy Storage, Dynamic Line Rating and Responsive Demand as Multiple Flexibility Resources <i>F. Gülşen Erdiç, Alper Çiçek, Ozan Erdiç and Recep Yumurtacı</i>
266	A New Second-Order Linear Approximation to AC OPF Managing Flexibility Provision in Smart Grids <i>Muhammad Usman and Florin Capitanescu</i>
304	Flexible and curtailable resource activation in a distribution network using nodal sensitivities <i>Md Umar Hashmi, Arpan Koirala, Hakan Ergun and Dirk Van Hertem</i>
400	QuickFlex: a Fast Algorithm for Flexible Region Construction for the TSO-DSO Coordination <i>Luis Lopez, Alvaro Gonzalez-Castellanos, David Pozo, Mardavij Roozbehani and Munther Dahleh</i>
22	Two-stage Approach for the Provision of Time-Dependent Flexibility at TSO-DSO Interface <i>Georgios C. Kryonidis, Apostolos N. Lois, Kyriaki-Nefeli D. Malamaki and Charis S. Demoulias</i>
32	Toward Stochastic Multi-period AC Security Constrained Optimal Power Flow to Procure Flexibility for Managing Congestion and Voltages <i>Mohammad Iman Alizadeh, Muhammad Usman and Florin Capitanescu</i>
312	Fair Congestion Management in Distribution Systems using Virtual Power Lines <i>Ruben D. Hernandez, Juan S. Giraldo, Georgios Tsaousoglou, Marcos J. Rider and Nikolaos G. Paterakis</i>
219	Transactive Energy Management Framework for Active Distribution Systems <i>Ali Rajaei, Sajjad Fattaheian-Dehkordi, Mahmud Fotuhi-Firuzabad and Matti Lehtonen</i>

SESSION 9 (Tue, Sep 7th 2021) Modeling, Simulation & ICT

Time: 17:30 – 19:00 (CEST)

Chair: Tarek ALSkaif

145	On the application of circuit theory and nonlinear dynamics to the design of highly efficient energy harvesting systems <i>Michele Bonnin, Fabio L. Traversa and Fabrizio Bonani</i>
1	Modeling Lithium-Ion Batteries Using Machine Learning Algorithms for Mild-Hybrid Vehicle Applications <i>Daniel Jerouschek, Omer Tan, Ralph Kennel and Ahmet Taskiran</i>
48	Speed-up Of Large-Scale Voltage Stability Simulations within a Fully Separated Modeler/Solver Framework <i>A. Guironnet, F. Rosière, G. Bureau and M. Saugier</i>
57	Model Identification and Parameter Tuning of Dynamic Loads in Power Distribution Grid: Digital Twin Approach <i>Nils Huxoll, Mohannad Aldebs, Payam Teimourzadeh Baboli, Sebastian Lehnhoff and Davood Babazadeh</i>
297	Ontology Modeling for Decentralized Household Energy Systems <i>Jiantao Wu, Fabrizio Orlandi, Tarek ALSkaif, Declan O'Sullivan and Soumyabrata Dev</i>
13	Towards a Scalable and Flexible Smart Grid Co-Simulation Environment to Investigate Communication Infrastructures for Resilient Distribution Grid Operation <i>Dennis van der Velde, Ömer Sen and Immanuel Hacker</i>
75	EMSaaS: A Dockerized framework for remote EMS deployment <i>Giancarlo Marafioti, Synne Fossoy, Johannes Philippus Maree and Iver Bakken Sperstad</i>
178	Fault detection in DC Microgrids using Recurrent Neural Networks <i>Ivan Grcić and Hrvoje Pandžić</i>
166	Deep Generative Graph Learning for Power Grid Synthesis <i>Mahdi Khodayar and Jianhui Wang</i>

SESSION 10 (Tue, Sep 7th 2021) Power System Operation II

Time: 19:30 – 21:00 (CEST)

Chair: Gerardo Osório

36	Adaptation of DER Control Schemes and Functions During MV Network Back-up Connection <i>Hannu Laaksonen, Chethan Parthasarathy, Hosna Khajeh and Miadrezha Shafie-Khah</i>
81	A Fast Non-Decoupled Algorithm to Solve the Load Flow Problem in Meshed Distribution Networks <i>Hugo Edgardo Hernández Fuentes, Francisco Javier Zarco Soto and José L. Martínez-Ramos</i>
277	Evaluation of wind power plants' control capabilities to provide primary frequency support during system restoration <i>Holger Becker, Manuel Fernando Valois-Rodriguez, Lukas Holicki, Kaveh Malekian and Pascal Gartmann</i>
143	Optimal partitioning in distributed state estimation considering a modified convergence criterion <i>Sajjad Asefi, Elena Gryazina and Helder Leite</i>
300	On the influence of electro-thermal modeling of overhead lines on curative congestion management in transmission systems <i>Jonas Mehlem, Katharina Kollenda, Sven Wieland, Amir Ali Panahi, Ralf Puffer and Albert Moser</i>
379	Steady-State and Dynamic Security Assessment for System Operation <i>Alexander Raab, Gert Mehlmann, Matthias Luther, Tom Sennewald, Steffen Schlegel and Dirk Westermann</i>
236	A Cooperative Game Theory-based Approach to Compute Participation Factors of Distributed Slack Buses <i>Mukesh Gautam, Narayan Bhusal, Jitendra Thapa and Mohammed Benidris</i>
37	Increasing the RES Hosting Capacity in Distribution Systems Through Reconfiguration with Closed-Loop Operation and Voltage Control <i>Juan M. Home-Ortiz, Leonardo H. Macedo, Renzo Vargas, Rubén Romero, José Roberto Sanches Mantovani and João P.S. Catalão</i>
112	A Proactive Resilience Enhancement Strategy to Electric Distribution System during Hurricanes <i>Michael Abdelmalak and Mohammed Benidris</i>

SESSION 11 (Wed, Sep 8th 2021) Demand Side Management

Time: 10:00 – 11:30 (CEST)

Chair: Akin Taşçıkaraoğlu

289	Impact of Demand Response Price Signal on Battery State of Charge Management at Office Buildings <i>Sota Kinoshita, Nobuyuki Yamaguchi, Fuyuki Sato and Shinichiro Ohtani</i>
250	Hierarchical Coordination of a Vehicle-to-Grid System to Improve Self-consumption in Building MicroGrids <i>Daniela Yassuda Yamashita, Ionel Vechiu and Jean-Paul Gaubert</i>
416	Enabling Vehicle-to-Grid and Grid-to-Vehicle Transactions via a Robust Home Energy Management System by Considering Battery Aging <i>Ali Soleimani, Vahid Vahidinasab and Jamshid Aghaei</i>
3	A Multi-objective Optimization Model for the Quantification of Flexibility in a Large Business Park <i>Nanda Kishor Panda and Nikolaos G. Paterakis</i>
50	Energy Management using Industrial Flexibility with Multi-objective Distributed Optimization <i>Debopama Sen Sarma, Tom Warendorf, Johanna Myrzik and Christian Rehtanz</i>
94	Optimal Investment Decisions for a Zero Emission Building under Uncertainty: Stochastic BUTLER <i>Ingrid Marie Andersen and Karen Byskov Lindberg</i>
361	A comparison of indoor temperature models for building demand response optimisation using MILP <i>Pedro L. Magalhães and Carlos Henggeler Antunes</i>
68	Energy Profile Clustering with Balancing Mechanism towards more Reliable Distributed Virtual Nodes for Demand Response <i>Ioannis Koskinas, Apostolos C. Tsolakis, Venizelos Venizelou, Dimosthenis Ioannidis, George E. Georghiou and Dimitrios Tzavaras</i>

SESSION 12 (Wed, Sep 8th 2021) Microgrids

Time: 12:00 – 13:30 (CEST)

Chair: Nikolaos Paterakis

288	A Renewable based Nano-grid for Smart Rural Residential Application <i>Abhishek Kumar, Yan Deng, Xiangning He, Praveen Kumar, R.C. Bansal and R. M. Naidoo</i>
357	Probabilistic-based Optimal Storage Placement and Sizing Enabling Networked Microgrid Community <i>Parikshit Pareek, Jiahang Xie, Yu Weng, Anshuman Singh and Hung Dinh Nguyen</i>
371	A multi-objective Energy Management System for microgrids: minimization of costs, exergy in input, and emissions <i>Federico Delfino, Giulio Ferro, Luca Parodi, Michela Robba, Mansueto Rossi, Martina Caliano, Marialaura Di Somma and Giorgio Graditi</i>
150	Microgrid Dispatch with Protection Constraints <i>Mateo Beus, Ivan Grčić and Hrvoje Pandžić</i>
61	Coupling Analysis for the Design of Industrial DC Microgrids <i>Darian Andreas Schaab, Jonas Knapp and Alexander Sauer</i>
119	An Improved Energy Management Strategy for a DC Microgrid including Electric Vehicle Fast Charging Stations <i>Siham Naser Hendi Alalwan, Amjad Muneim Mohammed, Akın Taşçıkaraoğlu and João P.S. Catalão</i>
229	Optimal Energy Resource Allocation in Isolated Micro Grid with Limited Supply Capacity <i>Ugonna Anuebunwa and Geev Mokryani</i>
424	A Coordinated Decentralized Loss Minimization Scheme for Hybrid AC/DC Distribution System with Multiple Microgrids <i>Moossa Khodadadi Arpanahi, Abolfazl Nateghi and Miadreza Shafie-Khah</i>
84	An Integrated Control and Protection Scheme for Microgrids <i>Saad Alzahrani, Khalil Sinjari and Joydeep Mitra</i>

SESSION 13 (Wed, Sep 8th 2021)
Power System Dynamics, Control & Power Quality

Time: 15:30 – 17:00 (CEST)

Chair: Hossein Hafezi

258	Detection of Misconfigurations in Power Distribution Grids using Deep Learning <i>David Fellner, Thomas I. Strasser and Wolfgang Kastner</i>
21	Distributed Methodology for Reactive Power Support of Transmission System <i>Georgios C. Kryonidis, Maria E. Tsampouri, Kyriaki-Nefeli D. Malamaki and Charis S. Demoulias</i>
204	Impact of uncertainty sources on the voltage control of active distribution grids <i>Marco Pau, Edoardo De Din, Ferdinanda Ponci, Paolo Attilio Pegoraro, Sara Sulis and Carlo Muscas</i>
103	Influence of autoregressive noise on the phasor data based disturbance classification <i>André Kummerow, Mohammad Dirbas, Cristian Monsalve, Steffen Nicolai and Peter Bretschneider</i>
98	Hosting Capacity Enhancement and Voltage Profile Improvement Using Series Power Electronic Compensator in LV Distribution Networks <i>Ehsan Kazemi-Robati, Hossein Hafezi, Roberto Faranda, Mohammad Sadegh Sepasian and Pierfrancesco Sodini</i>
284	Reducing the cost of maintaining the frequency stability using dc grid protection <i>Jay Dave, Hakan Ergun and Dirk Van Hertem</i>
301	Evaluation of the impact of Heat-Wave on Distribution System Resilience <i>Andrea Mazza, Yang Zhang, Chiara Carozzo, Ettore Bompard, Gianfranco Chicco, Emiliano Roggero and Giuliana Galofaro</i>
64	Harmonic Measurements in a Capacitive Voltage Transformer: Improvement Considering the Transformer's Design Parameters <i>Manuel De La Hoz, Juan Chacón, Dominique Alonso Sørensen, Urko Zatka Larrinaga and Cristina Rioja Barón</i>
348	Ancillary services from a residential community - a Norwegian case study <i>Rubi Rana, Kjersti Berg, Maren R. Brubæk and Olav B. Fosso</i>

SESSION 14 (Wed, Sep 8th 2021) Data Analytics

Time: 17:30 – 19:00 (CEST)

Chair: Tarek AlSkaif

78	Enhanced time series aggregation for long-term investment planning models of energy supply infrastructure in production plants <i>Lukas Hoettecke, Sebastian Thiem and Stefan Niessen</i>
133	Detection of Anomalies in Household Appliances from Disaggregated Load Consumption <i>Marco Castangia, Riccardo Sappa, Awet Abraha Girmay, Christian Camarda, Enrico Macii and Edoardo Patti</i>
272	Towards an Approach to Contextual Detection of Multi-Stage Cyber Attacks in Smart Grids <i>Ömer Sen, Dennis van der Velde, Katharina A. Wehrmeister, Immanuel Hacker, Martin Henze and Michael Andres</i>
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