AQUENERGY 29 APRIL AALBORG RESEARCH DAY PROGRAMME

AIFOR ENERGY – ENERGY FOR AI





AAU

ENERGY

AALBORG UNIVERSITY











08.30 - 09.30	REGISTRATION
08:30 - 09:30	COFFEE AND BREAKFAST ROLLS
09:30 - 09:35	WELCOME by Birgitte Bak-Jensen, Interim Head of Department

KEYNOTE SPEECHES

09:35 - 09:55	Al for Power Electronics – Power Electronics for Al by Huai Wang, Professor, AAU Energy
09:55 - 10:15	Going Beyond the Hype: Positive Disruption across the Energy Trading Lifecycle by Suraj Halai, Head of Al, Centrica Energy
10:15 - 10:35	Revolutionizing Variable Speed Drives: The Transformative Power of Al by Norbert Hanigovszki, Director, Danfoss Drives
10:35 – 10:55	Advanced Al techniques for modelling and management of battery systems and beyond! by Remus Teodorescu, Professor, AAU Energy
10:55 - 11:30	Break: networking, refreshments and relocation to sessions

11:30 - 13:00 Choose between our three sessions

SESSION 1	SESSION 2	SESSION 3	
AI-DRIVEN OPERATION AND INTEGRATION OF ENERGY SYSTEMS	AI IN DIAGNOSTICS, CONTROL, AND CYBERSECURITY	ADVANCED COMPUTATIONAL TECHNIQUES IN POWER AND ENERGY SYSTEMS	
Thomas Manns Vej 25 _{Café area}	Pontoppidanstræde 111 Auditorium 1.177	Pontoppidanstræde 101 Room 1.001	

SESSION 1 – AI–DRIVEN OPERATION AND INTEGRATION OF ENERGY SYSTEMS Thomas Manns Vej 25, café area, organised by Florin lov		
11:30 - 11:45	Opportunities for Machine Learning on Power to X by Simon Sahlin	
11:45 - 12:00	Scientific Machine Learning for Energy Systems in Green Transition by Shuzi Zhao	
12:00 - 12:15	Next-Generation Data-Driven Energy Systems by Najmeh Bazmohammadi	
12:15 - 12:25	Break to relocate to other sessions if desired	
12:25 - 12:40	Leveraging Artificial Intelligence to Exploit Flexibility Opportunities at DSO Level by Sreelatha Aihloor Subramanyam	
12:40 - 12:55	Innovative Al Approaches for Electric Vehicle Charging Scheduling and Smart Building Energy Management by Amin Hajizadeh	

SESSION 2 - AI IN DIAGNOSTICS, CONTROL, AND CYBERSECURITY
Pontoppidanstræde 111, Auditorium 1.177, oraanised by Huai Wana

11:30 - 11:45	Battery brains: how reinforcement learning make smarter and longer-lasting batteries by Farshid Naseri
11:45 - 12:00	Deep Learning-based Condition Monitoring of Synthetic Fiber Ropes by Anju Rani
12:00 - 12:15	Al for Cybersecurity in Microgrids by Baoze Wei

SESSION 2 - AI IN DIAGNOSTICS, CONTROL, AND CYBERSECURITY		
Pontoppidanstræde 111, Auditorium 1.177, organised by Huai Wang		

12:15 - 12:25	Break to relocate to other sessions if desired	
12:25 - 12:40	Al-Assisted Control of Power Electronics Converters by Mateja Novak	
12.40 12.55	Machina Loarning and Al for Diagnosis and Control	

12:40 - 12:55 Machine Learning and Al for Diagnosis and Control in Fuel Cells by Vincenzo Liso and Dan Yu

Pontoppidanstræde 101, room 1.001, organised by Frede Blaabjerg

11:30 - 11:45	Deep Learning Simulators by Petar Durdevic
11:45 - 12:00	Quantum Computations in Power Systems by Saeed Golestan
12:00 - 12:15	Multi-Physics Design and Optimization Framework of Power Electronic Components by Asger B. Jørgensen
12:15 - 12:25	Break to relocate to other sessions if desired
12:25 - 12:40	Ultra-Fast Inductance Extraction Using Convolutional Neural Networks by Pawel Piotr Kubulus
12:40 - 12:55	Al-Driven Decision-Making in Energy Markets by Sina Ghaemi

13:00 - 14:00 LUNCH / NETWORKING

located in AAU Innovate café and hall area

13:00 - 15:00	13:00 - 15:00	14:00 - 15:00	15:00 - 16:00
POSTER SESSION	LUNCH / NETWORKING	PITCH EVENT	PANEL DISCUSSION
13:00 - 15:00	POSTER SESSION AAU Innovate, Thomas Manns Vej 25, The Auditorium Organised by Frede Blaabjerg and Anette Larsen Detailed programme for the PhD Poster Session on page 7-8		
13:00 - 15:00	NETWORKING		
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14:00 - 15:00	AAU Innovate, Thomas Manns Ve	n es / ZU MINUTES ea ij 25, room COO9	cn
14:00 - 14:20	CEDAR: Cost Efficient heat pumps using DigitAl twins and Reinforcement learning by Associate Professor and CEO, Peter Gjøl Jensen, AAU Computer Science		
14:20 - 14:40	AITEKS: Artificial Intelligence Tech Support for SMEs by Associate Professor Petar Durdevic, AAU Energy		
14:40 - 15:00	SpikeNet: A Spike Based Impenetrable Secure Coordination Network for Power Grids by Postdoc Yubo Song, AAU Energy		

15:00 - 16:00

PANEL DISCUSSION

AAU Innovate, Thomas Manns Vej 25, café area. Moderator: Helene Gottschalk

- Norbert Hanigovszki
 Director, Danfoss Drives
- Suraj Halai Head of Al, Centrica Energy
- Huai Wang
 Professor, Department of Energy, Aalborg University
- **Thomas Ploug** Professor, Department of Communication and Psychology
- **Torben Bach Pedersen** Professor, Department of Computer Science, Aalborg University
- Remus Teodorescu
 Professor, Department of Energy, Aalborg University
- 16:00 16:05 CLOSING REMARKS

by Amjad Anvari-Moghaddam, Vice-head of Research, Department of Energy

16:05 - 16:30 **REFRESHMENTS**

POSTER SESSION		
TITEL	AUTHOR	
Optimal Power Control of PEM Electrolyzers Considering Degradation	Hamed Nezhadkhatami	
Desing of over-voltage protection in Class-E push-pull converter	Hassan Mujitaba	
Modelling the effect of Electrothermal balanced operation on product formation of SOEC system through microkinetic	lfrah Akhtar	
PINN Approach for Early Degradation Trajectory Prediction of IGBT Modules	Jie Kong	
System Strength Assessment For IBR Integration	Jonathan Cervantes	
Harmonic Power Flow (Multi-Wind Power Plants Connected to a Common Busbar)	Jun-Xin Song	
Evaluating Biocrude Pretreatment Methods for HTL Upgrading	Leah Kristen Rai	
Hierarchical Operation Management System for Network Microgrids to Enhancement Resilience of Power System Using Mobile Energy Storage System	Majid Ali	
Performance Evaluation of Three-Phase, Two-Level Medium Voltage Power Stack Based on 10 kV SiC MOSFETs	Morten Rahr Nielsen	
Medium Voltage SiC MOSFETs (Characterization, Device Modelling and Parallel connection)	Nianzun Qi	

POSTER SESSION	
TITEL	AUTHOR
Impact of PWM Techniques on Conducted Emission in Three Phase DC-fed Motor Drives	Pooja Babu
Reliability Analysis of SiC-MOSFET-based Integrated Motor Drives for High-speed Applications	Soroush Ahooye Atashin
Multiphysics modelling of alkaline water electro- lysis stacks (Assessing stack design and cell-to- cell variations in operating conditions through physics-based modelling)	Vicente Olguín Godoy
Condition Monitoring for DC-link Capacitors and PV arrays based on the Start-up Process of the PV System	Yongjie Liu
Battery Monitoring Using KalmanNet (Al for Robust State-of-Charge Estimation in Batteries)	Farshid Naseri

PRACTICAL INFORMATION

AAU MAP



Scan the OR-code to connect to the events WIRELESS NETWORK

