

2026 IEEE Conference on Technologies for Sustainability (SusTech 2026)

**Los Angeles, California, USA
19-22 April 2026**

IEEE Catalog Number:
ISBN:

CFP26STS-POD
979-8-3315-9259-2



Copyright © 2026, IEEE

All Rights Reserved

Copyright and Reprint Permissions:

Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP26STS-POD
ISBN (Print-On-Demand):	979-8-3315-9259-2
ISBN (Online):	979-8-3315-9258-5
ISSN:	2640-6829

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA

Phone:	(845) 758-0400
Fax:	(845) 758-2633
E-mail:	curran@proceedings.com
Web:	www.proceedings.com

TABLE OF CONTENTS

Optimization Algorithms for Sustainable Vertical Farming: Enhancing Aquaponics Efficiency	1
<i>Mariam Mamdouh, Maria Boutros, AlielDeen Hamdy, Omar M. Shehata</i>	
Understanding Farmer Adoption of Artificial Intelligence in Agriculture: A Systematic Review and Socio-Technical Model Grounded in Midwest Farming Systems	7
<i>Abeer F. Alkhwaldi, Cherie Noteboom, Amir A. Abdulmuhsin</i>	
Irrigation Scheduling Dataset Extraction Using LLM-Mined Research Evidence.....	15
<i>Sruthi Manoj, Pallavi Bajpai</i>	
Influence of Biohumus on the Agrochemical Characteristics, Soil Fertility, and Yield Performance in Open-Field Cultivation.....	23
<i>Zhangyl Abilbek, Assel Bizhanova, Dilnaz Rakhmet, Umar Adam Ibrahim, Elmira Ospankulova</i>	
A Novel Statistical Raw Data–Driven Approach for Frequency Event Detection in Power Systems	31
<i>Hussain A. Alghamdi, Midrar A. Adham, Mohammed A. Alghamdi, Othman A. Murad, Robert B. Bass</i>	
From Cost to Carbon: A Campus Case Study on Storage-Enabled Dispatch and Demand Shaping.....	37
<i>Ahmed Saad Al-Karsani, Maryam Khanbaghi</i>	
Hybrid Energy Storage Modeling for Energy Efficient Electric Public Transportation Considering Power Converter Losses	45
<i>Henar Mike O. Canilang, Yurim Cheon, Youjeong Yoon, Wansu Lim</i>	
Advanced Ensemble Learning for Lithium-Ion Battery State of Health in Smart Transportation Fleets	52
<i>Sai Madhav Yedupati, Nitin Nitin, Manisha T. Shah, Dyllon Dekok, Marc Cahay</i>	
Utilizing Second-Life EV Batteries to Mitigate PV-Induced Overvoltages in LV networks.....	59
<i>Evangelos Pompodakis, Arif Ahmed</i>	
A Two-Stage Framework for Power Grid Asset Management: Circuit Breaker Replacement Cases	66
<i>Yiming Chen, Santiago Grijalva, Lukas Graber, Zhiyang Jin</i>	
HADASI: The Human-ADAS Interaction Standard for Sustainable Driving Behaviors	73
<i>Minh Sang Pham Do, Anh Tuan Vu, Gerrit Meixner</i>	
Weather-Aware Domain Adaptation for Street-View Weather Recognition	80
<i>Hossein Maghsoumi, George Atia, Yaser P. Fallah</i>	
Explainable AI Enhanced Traffic Forecasting for Proactive Autonomous Vehicle Routing.....	87
<i>Jingyu Yao, Chao Yao, Yue Chen, Xiaoming Liu, Danni Huang, Weishen Chu</i>	
A Data-Driven Analysis of Traffic Patterns in Downtown San Jose, California	94
<i>Samriddhi Matharu, Maryam Khazaei</i>	
Critical Transit Infrastructure in Smart Cities and Urban Air Quality: A Multi-City Seasonal Comparison of Ridership and PM _{2.5}	102
<i>Sean Elliott, Sohini Roy</i>	

Modeling Electric Vehicle Adoption at the ZIP Code Level: A Bass Diffusion and Machine Learning Approach	110
<i>Angelina Li, Zuzhao Ye, Nanpeng Yu</i>	
A Multi-Agent System for Building-Age Cohort Mapping to Support Urban Energy Planning	117
<i>Kundan Thota, Thorsten Schlachter, Veit Hagenmeyer</i>	
YOLO-Based Real-Time Detection of Beet Pests for Integrated Pest Management.....	125
<i>Avni Goyal</i>	
Designing Human-Centered Technologies to Support Social Enterprise Urban Farmers	131
<i>Feifei Pang, Rob Grace, Lauren Forbes, Jess Kropczynski</i>	
Bottom-Up Predictive Modeling for EV Adoption and Grid Planning: A Data-Driven Framework Leveraging Artificial Intelligence.....	139
<i>Alec Zhixiao Lin, Isaac Chen Fu, David Zhongxuan Ruan</i>	
InsightPlug: Addressing Consumer Cost Misperceptions for Electric Vehicles Through Local Scenarios and LLM-Driven Explanations	147
<i>Yulin Zeng, Sharon Hsiao, Yuhong Liu</i>	
Large Language Model Guided Reinforcement Learning for Heat Pump Control in Smart Buildings.....	149
<i>Gökhan Demirel, Natascha Fernengel, Hallah Butt, Natalie Rapp, Kevin Förderer, Veit Hagenmeyer</i>	
Thermal Performance and Energy Modeling of a Geodesic Dome	157
<i>Shreya Acharya, Serdar Celik</i>	
Retail Market Pricing Considering Uncertainty	162
<i>Sultan Hassan Hakmi</i>	
Do Costs, Energy Prices, or Peer Adoption Matter More? Insights into Renewable Implementation Decisions for SMEs.....	167
<i>Esma Sahin, Liang Zhang</i>	
Do-It-Yourself Approach to Oscillating Hydropower	175
<i>Matej Sečnik, Marko Hočevár, Tone Godeša, Tadej Brodarič, Gašper Rak, Francesco Nascimben, Giovanna Cavazzini</i>	
Benchmarking Transformer and xLSTM for Time-Series Forecasting of Heat Consumption	179
<i>Marja Wahl, Daniel R. Bayer, Sven Rausch, Marco Pruckner</i>	
Social Entrepreneurship in Africa: Bridging Cultural Values and Sustainable Solutions.....	187
<i>Emmanuel Ahatsi, Joseph Akpan, Oludolapo Olanrewaju</i>	
Optimizing Cruise Ship Itineraries: A Sustainable Perspective	194
<i>Chiara Maragò, Rosita Guido, Francesca Guerriero, Gianpaolo Iazzolino</i>	
Visualization Beyond Summarization: An AI-Infused Context-Aware Method to Make Sustainability Content Digestible	202
<i>Mahisha Gunasekaran, I-Han Hsiao</i>	
Advancing a Sustainable Future: Integrating Technological Innovation, Policy, and Community Engagement: A Review	210
<i>Mohammad Ghulam Ali</i>	

Wearable Technology Supporting SDGs: A Feasibility Study on Augmented Reality Streetwear for HIV Awareness	220
<i>Johanne Raymond S. Gaspar, Siena C. Gamohay, Renz Angelo B. Eugenio, Jeremy N. Nervar, Ralph Angelico D. Lagunzad, Jaypy T. Tenerife</i>	
Urban Sustainability Semantic Association with UN SDG Targets: Socio-Technical Systems View	228
<i>Alekhya Velagapudi, David Tipper, Katrina Kelly-Pitou</i>	
Sustainable Credit Card Fraud Detection for Resilient E-commerce Systems in Ghana.....	236
<i>Emmanuel Ahatsi, Mathias Agbeko, Nicholas Dowornu Mawulorm, Oludolapo Olanrewaju</i>	
Life Cycle Assessment of 3D Stacked Multi-Chip Assemblies: Comparison of Three Multi-Layer CMOS Image Sensors	242
<i>Maxime Péralta, Mathilde Billaud</i>	
A Circular Canvas for Manufacturing MSMEs to Support the Transition Toward the Circular Economy.....	250
<i>Sandra Gonzales-Valencia, Wendi Chipana-Garcia, Trixy Rojas-Tunque, Elizabeth Vidal-Duarte</i>	
Building Resilient Knowledge Infrastructures: A Sustainable Risk Governance Framework for Public Libraries in the Philippines.....	257
<i>Johanne Raymond S. Gaspar, Martin Luis H. Vibar, Ralph Angelico D. Lagunzad, Channen Kyle S. Cruz, Jeremy N. Nervar, Jaypy T. Tenerife</i>	
A Structured Checkpoint Framework for Early Integration and Validation of Schedule and Cost Baselines in Construction Planning.....	264
<i>Taleb Alnajjar, Qais Amarkhil, Anwar Alroomi, Sami Maalouf</i>	
Reinforcement Learning-Assisted Design of Active and Reactive Power Control for GFM Inverters with Various Grid Strengths	271
<i>Shyamal S. Chand, Arman Ali, Majid Farhangi, Maurizio Cirrincione, Branislav Hredzak</i>	
Optimal Sizing and Cost Minimization of a Grid-Connected Wind-Biomass-Battery Hybrid Energy System via Mantis Shrimp Optimization.....	279
<i>Hoda Abd El-Sattar, Salah Kamel, Francisco Jurado</i>	
Toward Climate-Smart Microgrids: Quantifying Energy Efficiency, Carbon Reduction, and Lifecycle Sustainability through Edge Computing.....	286
<i>Anthony F. Nyoyoko, Peter M. Jansson</i>	
Anomaly Detection and Compensation System on Solar Smart Inverters Using Isolation Forest	291
<i>Zheyu Zhang, Tafsir Ahmed Khan, Saifur Rahman</i>	
Hybrid Active-Passive Power Quality Enhancement for Power Distribution Systems	296
<i>Bandar Alshehri, Turki Omar Al-Shehri, Mohanna Usama Mohanna, Abdulwahab Ateeq, Zakaria Elbarbary, Saad F. Al-Gahtani, Mohammad Irshad</i>	
A Retrieval-Augmented Agent for Context-Aware Waste Classification Across National Systems.....	303
<i>Katja Crusius, Joan Puteri Zheng</i>	
An Agentic-Inspired Approach to the Recycling Environmental Challenge	308
<i>Laci Parker, Mark Allison</i>	
RecycleSense: Machine Learning Visual Recognition for Waste Sorting and Recycling Optimization.....	315
<i>Talya Nir, Atul Dubey</i>	

BottleEdgeNet: A Calibrated Edge-Convolutional Neural Network (CNN) Framework for PET Bottle Quality Inspection in Deposit Return Schemes (DRS)	323
<i>László Duma, Marcos Daniel Cortijo Mendoza</i>	
Comprehensive Study of Data-Driven Approaches for Ready Biodegradability Classification.....	331
<i>Kundjanasith Thonglek, Palida Pongsanon, Autchara Pagon</i>	
XpressWeed: Meta-Inspired Few-Shot Adaptation for Plant Weed Segmentation Using Texture Priors	339
<i>Kiran K. Kethineni, Rishi Raj Kanukuntla, Saraju P. Mohanty, Elias Kougianos</i>	
Deep Learning-Based Fault Detection Framework for Predictive Maintenance in HVAC Systems	346
<i>Muhammad Usman, Faizan Hamayat, Alishba Mahnoor, Muhammad Faheem, Haider Ali, Laraib Hamayat</i>	
BA-GUSL: Boundary-Aware Green U-Shaped Learning for Nuclei Segmentation	354
<i>Catherine A. Christie Alexander, Vasileios Magoulaitis, Jiaxin Yang, C.-C. Jay Kuo</i>	
Development of a Neural Network-Based Algorithm for HVAC Systems Optimization, Integrating Key Environmental Variables in BEMS	362
<i>Daniel F. Espejel-Blanco, Oscar G. Meza-Pacheco, Jose A. Hoyo-Montano, Carlos A. Pereyda-Pierre, Jesus M. Tarin-Fontes, Jose J. E. Medina-Gutierrez</i>	
Human-Centered Adoption of AI HVAC Optimization Tools	368
<i>Robert Kong, Ridhiman Patwari</i>	
Machine Learning for Predicting and Managing Industrial CO and NOx Emissions: Data-Driven Modeling for Sustainable Production	372
<i>Dilara Abzhanova, Sapar Toxanov, Andrii Biloshchytskyi</i>	
Soilnity: An IoT-Enabled Sustainable Soil Salinity Management System Using Biochar and Green Manuring	379
<i>Jitanshika Kumar, Shahil Singh, Rahul Chand, Salsabil Nusair, Krishan Kumar, Gavin Khan, Sushita Sharma</i>	
Modeling Local Weather for Temperature Difference Characterization in TEG Powered Devices	387
<i>Julio Aráuz, Onanong Autama</i>	
RISE: RISC-V Intermittent System Extensions for Batteryless IoT Devices.....	395
<i>Samuele Pasquale, Ali Shafiee Sarvestani, Arman Roohi</i>	
The Case for AI-Integrated Monitoring in Soft Fruit Production: Development of the SPADE System	403
<i>Edward Jennings, Shahid M. Awan, Naeem Ramzan, Muhammad Z. Shakir</i>	
Barometric Pressure Sensing Using Crowd-Sourced Smartphone Data.....	409
<i>Hofit Shachaf, Noam David</i>	
CNN-Based Turbidity Estimation in Dairy Farms Environments	413
<i>Abdullah Al Rawi, Behrooz Pakzadeh, Pramod Pandey</i>	
Small Scale Production of Biochar with a Home Microwave Oven.....	421
<i>Charles Jackson</i>	
A DC-DC Boost Converter with Maximum Power Point Tracking for Miniaturized Solid Oxide Fuel Cells.....	425
<i>Hongyu Sui, Hao Ren</i>	

Net Environmental Impact Classification of Copper, Zinc, and Lead in UK Offshore Wind Systems	433
<i>Thashmika Bandara, Mahinsasa Rathnayake, Veselin Rakocevic</i>	
A Structured Approach for Integrating Environmental Impact Assessment Throughout the IC Design Flow	441
<i>Maxime Péralta, Thibault Halter, Ivan Miro-Panades, Chiara Sandionigi</i>	
Innovation in the Pyroligneous Liquor Extraction Process	449
<i>Marcelo Perotoni, Marcio Silva, Ricardo Gaspar</i>	
Predictive Self-Healing for Multi-Agent LLM Pipelines Using Model Predictive Control	455
<i>Tejas Pravinbhai Patel, Amit Kumar Padhy, Sandeep Shivam, Viswanathan Ranganathan, Arun Kumar Elengovan, Deepak Kole</i>	
Quantum-Enhanced Real-Time CO ₂ Classification System for Urban Environmental Monitoring.....	463
<i>German Granados, Carlos Sierra Arreaga, Maria Mora Quinde, Nathaly Burgos Tomala, Washington Velasquez</i>	
A Review of AI-Based Optimization and Monitoring Using Wearable Data in Smart Buildings	470
<i>Salma Ghafouri Varzaneh, Mostafa Zaman, Nasibeh Zohrabi, Sherif Abdelwahed</i>	
A Multi-Level Reinforcement Learning Framework for Smart Building Management	478
<i>Mostafa Zaman, Stefano Iannucci, Nasibeh Zohrabi, Sherif Abdelwahed</i>	
Advancing Digital Agriculture with a Flexible Spatio-Temporal Data Architecture for Long-Term Research and Management.....	486
<i>Emery Silberman, Kimberly Gibson, Leigh A. Bernacchi, Joshua H. Viers</i>	
ClimateCV: The Potential of Computer Vision Applications in Climate Change Mitigation and Adaptation	494
<i>Nermeen Abou Baker, Uwe Handmann</i>	
Development of an App for Estimating Criteria for Net Zero Building Based on the Passive House Standard: ÁBita	502
<i>Gabriel Yoel Gonzalez Cera, Aimee Alejandra Villegas Perez, Jorge Echeagaray Gonzalez, Josue Aaron Lopez Leyva</i>	
Stochastic Multi-Objective Planning of Smart Integrated Renewable Energy System (SIREs) under Demand and Resource Uncertainty	507
<i>Zeel Maheshwari, Shariqa Tayabee</i>	
Software Sustainability Debt and the Governance-Process-Execution Framework: Evidence from 513,000 Real-World CI/CD Workflows	514
<i>Rohit Dhawan, Minav Suresh Patel, Priyank Desai, Ankush Dhar</i>	
Resource Efficiency Software Index (RESI): Towards Software Product Comparability	522
<i>Geerd-Dietger Hoffmann, Verena Majuntke</i>	
Quantification and Surrogate Model Estimation of Spatial-Temporal Carbon Intensity Factors	530
<i>Daniel R. Bayer, Jonas Schiller, Thanh Mai Pham, Marco Pruckner</i>	
An Integrated Fuzzy-Entropy and Fuzzy-Improved-MULTIMOORA Approach for the Selection of Energy Storage Technologies	538
<i>Moshood Akanni Alao, Olawale Popoola</i>	

Data-Driven Lake Water Quality Forecasting for Time Series with Missing Data Using Machine Learning	546
<i>Rishit Chatterjee, Tahiya Chowdhury</i>	
Voltage Control Modeling in Membrane Capacitive Deionization (MCDI) for Desalination Applications.....	554
<i>Bernard Raphael Altamira, Mark Joseph Javier, Lucky Angelico Nagpala, Rowena Carpio, Jenna Riscy Manio, Patricia Nadine Revilla, Marx Lenin Laycano</i>	
Environmental and Social Risk Management for Dam Decommissioning: A Mixed-Methods Case Study.....	562
<i>Mohammed Alsharqawi, Siman Imran Khan, Athira Kudilil Shaji, Aiswarya Shylajan, Santo Sunny</i>	
A Solar-Powered Flood Early Warning System with SMS Alerts to Enhance Community Preparedness in the Philippines	569
<i>Vielle Digor, Vincent Stephen Castillo, Ralph Jason Delos Santos, Jaypy Tenerife, Maricar Navarro</i>	
Multi-Modal Coordinated Sensing for Spatially-Aware Marine Monitoring	576
<i>Endrowednes Kuantama, Alice James, Avishkar Seth, Ningning Hou, Melanie Bishop</i>	
Predictive Mapping of Materials in the Triboelectric Series Using Graph Neural Networks.....	584
<i>Adyant Bhavsar</i>	
Energy Efficiency Improvement by Compressor Waste-Heat Recovery: an Industry Case Study	590
<i>Nuno Soares Domingues, Daiva Stanelytė</i>	
Teaching Off-Grid Solar Energy Installation Business in Liberia	597
<i>Charles E. Hunt, Javier A. Romero R., Abraham Foday</i>	
Non-Contact Electrostatic Cleaning of Photovoltaic Panels Using Corona-Induced Charge Transfer.....	604
<i>Mohammad R. Ahmed, Arif M. Rahman, Aaron T. Ohta</i>	
EV Charging Mandates and Their Impact on Load Profiles in Multi-Unit Residential Buildings	612
<i>Yesaswini Chilukuri, Adil Usman, Pramod J Chaudhary, Payman Dehghanian, Wei-Jen Lee, Bharat Singh Rajpurohit</i>	
Power Optimization for Sustainable Smart Speakers: Echo Pop Case Study.....	619
<i>Riccha Tripathi, Dibyendu Nandy, Marco Pulido, Joey Escobar, Jeongwoo Han</i>	
Smart Redundant Management of a Next-Generation Critical Power Grid Infrastructure	624
<i>Srdjan Skok, Dunja Srpak, Dubravko Sabolic, Sasa Aksentijevic</i>	
Explainable AI to Examine Effects of Segmentation on Cyberattack Classifications in Power Transmission System.....	630
<i>David Rodriguez-Borrueal, Paras Mandal, Gelli Ravikumar</i>	
Coordinated Datacenters as Virtual Power Plants: Demand Flexibility for Transmission-Level Congestion Mitigation	637
<i>Luciano A. Paniagua, Paras Mandal</i>	
Hybrid AC/DC Transmission Network Expansion Planning with Voltage Security Constraints Using NSGA-II Optimization Algorithm	644
<i>Mojtaba Ahanch, Mehran Sanjabiasasi, Roy A. McCann, Sandra C. Rivera</i>	

Quantifying the Impact of Load Outliers on Demand Charges for Non-residential Customers.....	650
<i>B Hari Kiran Reddy, Sivanand Puliyadi Ravi</i>	
Design of a Geographic Information System for Monitoring the Electrical Distribution Network: A Sustainability Approach.....	657
<i>Regina Ibarra Bustamante, Lorena Hernandez Casarrubias, Ivan Bustamante Salaya, Juan Pablo Cárdenas De Dios, Josue Aaron Lopez Leyva</i>	
Reverse-Engineering Commercial Microwave Link Data for Extracting Environmental Information	662
<i>Tal Weissblat, Noam David</i>	
Enhanced Doppler-Based River Flow Measurement System Using Cross-Correlation Signal Processing.....	666
<i>A. V. Neftissov, A. A. Biloshchytskyi, I. M. Kazambaev, L. N. Kirichenko, A. Medetkhan, A.D. Mikryakov</i>	
Contrastive Learning-Enhanced Attention Models for Predicting and Optimizing Brine Desalination Processes	671
<i>Abdallah Ragab, Tamer ElBatt, Essam Mohamed, Ahmed M. Azzam, Amira T. Mohamed, Omar Sheta, Ghada Ahmed, Elaf Seif</i>	
Beyond Silicon Area: Co-Product Allocation for a Binning-Aware Carbon Footprint of Processors	679
<i>Olivier Weppe, Thibaut Marty, Jean-Christophe Prévotet, Maxime Pelcat</i>	
Satellite Based Hydrological Feature Engineering and Clustered Time Series Modeling for Sustainable Reservoir Water Management	687
<i>Andrii Biloshchytskyi, Alexandr Neftissov, Ilyas Kazambayev, Lalita Kirichenko, Aliya Aubakirova, Ainur Medetkhan, Oleksandr Kuchanskyi, Svitlana Biloshchytska, Mukhtar Orazbay</i>	
Shared Advantage: AI-Enabled Agrifood Value Chains between the U.S. Midwest and Africa.....	694
<i>P.T. Adidam</i>	
A Novel Technology Towards Carbon Smart Road- Development of Value-Added Products from End-of-Life Plastic Waste.....	696
<i>M. Kasture, G. Singh, A. Behl, T. Chiranjeevi, R.V. Kumar, Chandrasekhar</i>	
AI-infused Educational Technology for Personalized Environmental Sustainability Practices	698
<i>Q. Sun, S.I. Hsiao, S. Chien</i>	
A Microbial Fuel Cell Biosensor with Deep Learning-Enabled High Selectivity	700
<i>Y. Wang, F. Tang, B. Liu, H. Ren</i>	

Author Index