

American Society of Agricultural and Biological Engineers Annual International Meeting (ASABE 2025)

**Toronto, Ontario, Canada
13-16 July 2025**

Volume 1 of 2

ISBN: 979-8-3313-2459-9

Printed from e-media with permission by:

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



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2025) by American Society of Agricultural & Biological Engineers
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact American Society of Agricultural & Biological Engineers at the address below.

American Society of Agricultural & Biological Engineers
2950 Niles Road
St. Joseph, MI 49085
USA

Phone: (269) 429-0300
Fax: (269) 429-3852

hq@asabe.org

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
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

| | |
|--|-----|
| Enhancing Cantaloupe and Broccoli Water Productivity Under Arid Climate Conditions in Arizona | 1 |
| <i>Diaa Eldin Elshikha, Said Attalah, Peter Waller, Douglas Hunsaker, Kelly Thorp, Clinton Williams, Debankur Sanyal, Bhupinder Singh, Charles Sanchez, Randy Norton, Shaddy Alshraah, Ed Barnes, Ethan Orr, Elsayed Ahmed Elsadek</i> | |
| Determination and Water Quality Assessment of Community Water Systems from Selected Rural Coastal Communities in the Province of Davao Del Sur..... | 15 |
| <i>Mark Jude Ferrando Trondillo, James Phil Decrepito Flores, Kris Kristofferson Tan, Larra Mae B. Testado</i> | |
| Recirculating Drip Irrigation System Using Seaweed (Kappaphycus Sp.) Drippings for Hydroponic Production of Cherry Tomatoes..... | 26 |
| <i>Mark Jude Ferrando Trondillo, Vitaliana U Malamug, Marvin M. Cenense, Jeffrey A Lavarias</i> | |
| Ergonomic Evaluation of Farm Machinery and the Environment in Rivers State Nigeria..... | 37 |
| <i>I. G. Wobo, L. G. Firima, T. O. Olanrewaju</i> | |
| Revealing the Influence of Supercooling and Pressure in Pressure-Shift Freezing on Freshwater Surimi Gel Properties | 52 |
| <i>Sinan Zhang Student, Hosahalli S. Ramaswamy, Songming Zhu, Yong Yu</i> | |
| Modelling Manure pH Change Using a Newly Developed pH Model in Manure-DNDC | 66 |
| <i>Birk Li, Zhiming Qi, Andrew C Vanderzaag, Brian B Grant, Ward N Smith</i> | |
| Development and Testing of a Wind-Pollination Drone for Greenhouse Tomatoes | 72 |
| <i>Puqi Liu, Qiang Shi, Bin Wang, Lu You, Yong Liu, Yongzhong Zhang</i> | |
| Meta Ag 2.0: a Framework for AI-Infused Contextual Agricultural Recordkeeping..... | 81 |
| <i>Md. Samiul Basir, Aarav Pai, Lionel Y. Loo, Fabio A. Castiblanco, Joshua K. Bailey, Andrew Balmos, Dennis R. Buckmaster, James V. Krogmeier</i> | |
| Effect of Sun and Solar Drying on the Proximate Composition and Mineral Properties of Zobo Leaves..... | 93 |
| <i>Ikechukwu Henry Nwobodo, Akindele Folarin Alonge, Inimfon Samuel Ossom, David N Onwe, Opeyemi Fatunla, Kate Igoche</i> | |
| Effect of Drying Methods on the Drying Kinetics, Proximate Analysis and Functional Properties of Yellow Cassava (Manihot Esculenta) | 100 |
| <i>Ekpo Nkpoikanaabasi Clinton, Akindele Folarin Alonge, Inimfon Samuel Ossom, Nnamntefon Etuk, Michael A Ojelade, Rhoda Banjo</i> | |
| Digitalization Potentials in the Dairy Value Chain for Inclusive Growth in Uganda | 110 |
| <i>Bernard Kabagambe, Grace Modupe Adebo</i> | |
| Life Cycle Assessment of Bioenergy Production from Anaerobic Co-Digestion of Cow Dung with Rice Straw | 129 |
| <i>Chayan Kumer Saha, Lucky Khatun, Md. Monjurul Alam</i> | |

| | |
|---|-----|
| IoT Based Smart Hybrid HortiCool Solution for Increasing Shelf-Life of Fruits and Vegetables in Bangladesh | 135 |
| <i>Chayan Kumer Saha, Saikat Biswas, Md. Abu Yousuf Prodhan, Sahabuddin Ahamed, Surajit Sarkar</i> | |
| Evaluation of Smart Hybrid Solar Dryer for Drying Mango (<i>Mangifera Indica L.</i>) in Bangladesh | 141 |
| <i>Chayan Kumer Saha, Jakia Khatun, Md. Rayhanul Karim, Israt Jahan, Taslimun Nahar, Md. Abu Hanif, Surajit Sarker, Poly Karmokar</i> | |
| Agrivoltaics in Germany: Synergies, Challenges, and Potentials for Sustainable Land Use | 148 |
| <i>Heinz Bernhardt, Christina Maria Sebald, Fredrik Regler, Simon Grebner</i> | |
| Development of 3G Rice-Soy Snacks: Effects of Extrusion and Frying Conditions on Physical, Chemical, and Thermal Properties | 155 |
| <i>Mayowa Saeed Sanusi, Abdulkareem Bamidele Bello, Micheal Ademuyiwa Salako, Ibrahim Omobolaji Ibrahim, Toheeb Babatunde Olaniran, Musliu Olushola Sunmonu</i> | |
| Optimization of Designs and Operational Parameters for GREENBOX Farming System | 168 |
| <i>Jinghang Zhuo, Wei Ren, Xiusheng Yang</i> | |
| Evaluation of Semi-Mechanized and Assisted Coffee Harvesting Methods in Puerto Rico..... | 185 |
| <i>Francisco M Monroig-Saltar, Elvin A Roman-Aponte, Carlos A Flores-Ortega, Miguel F Monroig-Ingles</i> | |
| Implementing Hydrogen as Long-Term Energy Storage for Dairy Farms | 193 |
| <i>Fredrik Johann Regler, Markus Ostermeier, Reinhard Dietrich, Franz Behm, Michael Spath, Heinz Bernhardt</i> | |
| Application of Deep Learning in Counting and Gender Identification of Parasitoid Wasps: a Case Study of <i>Trissolcus</i> Sp. (Hymenoptera: Scelionidae) | 198 |
| <i>Chiao-Jo Tung, Yi-Hui Wu, Shih-Yang Lee, Yan-Fu Kuo</i> | |
| Characteristic Analysis of Deep-Bed Cooling and Drying of Pelleted Feed Based on Non-equilibrium Model..... | 204 |
| <i>Wei Wang, Hongying Wang, Liangju Wang, Shaochun Ma</i> | |
| Assessing the Impacts of Tillage, Manure Management, and Crop Rotation on Soil Carbon Dynamics and Crop Growth in Eastern Canada | 215 |
| <i>Ruth C Sitienei, Zhiming Qi, Brian B Grant, Andrew C Vanderzaag, Guillaume Jego, Martin Chantigny, Marie-Elise Samson, Budong Qian, Ward N Smith</i> | |
| Statistical Analysis of the Impact of Weather Parameters on Wild Blueberry Yield (A Case Study; Nova Scotia)..... | 248 |
| <i>Mona Golabi, Travis Esau</i> | |
| Evaluation of the Effect of Climate Change in Nova Scotia with Approach of Forecasting Evapotranspiration..... | 263 |
| <i>Mona Golabi, Travis Esau</i> | |
| MHSC-Seg: a Lightweight Semantic Segmentation Model Specifically Designed for Impurity Segmentation in Machine-Harvested Seed Cotton | 275 |
| <i>Shicheng Hong, Xiang Qiu, Sanhui Wang, Mengyun Zhang, Huting Wang</i> | |
| A Novel Method for Differentiating Soil Organic Matter in a Field Using Soil Survey Maps | 285 |
| <i>Hamed Etezadi, Viacheslav Adamchuk, Yacine Bouroubi, Maxime Leduc, Marc-Olivier Gasser, David Titley-Peloquin</i> | |

| | |
|---|-----|
| Performance Evaluation of a Double-Conveyor Type Sweet Potato Harvester According to Soil Texture..... | 292 |
| <i>Jinho Won, Jung-Yeon Seo, Dae-Cheol Kim, Yongjin Cho</i> | |
| Prediction and Spatial Mapping of Soil Properties Using UAV-Based Multispectral Imagery and Random Forest Regression..... | 300 |
| <i>Juneyoung Han, In Seop Jang, Dae-Cheol Kim, Yongjin Cho</i> | |
| Development of a Portable Device for Small-Sized Insect Pests Detection Using CAFE-YOLO..... | 309 |
| <i>Pei-Yu Chen, Ta-Te Lin</i> | |
| An Innovative Multi-UAV System for High-Throughput Phenotyping of Muskmelon Plants in Greenhouses | 323 |
| <i>Tzu Hsu, Jing-Heng Lin, Ta-Te Lin</i> | |
| Smart Beehive Health Monitoring and Forecasting Based on Multi-Sensor Data and Machine Learning | 343 |
| <i>Po-Hsun Cheng, Yi-Lin Liu, Ta-Te Lin</i> | |
| Comparison of Preprocessing Methods in Estimating Total Nitrogen in Soils Using PLSR Based on Diffuse Reflectance Spectroscopy..... | 358 |
| <i>Jeongju Chae, In Seop Jang, Dae-Cheol Kim, Yongjin Cho</i> | |
| Three-Dimensional Image Reconstruction of RGB and Chlorophyll Fluorescence Point Cloud for Plant Phenotyping Using a Gantry Robot System..... | 366 |
| <i>Jiun-Wei Yi, Cheng-Hao Lin, Hsiao-Mei Wu</i> | |
| Comparative Analysis of Load and Power Characteristics According to Mechanical Mechanisms of Tractor-Mounted Sweet Potato Harvesters..... | 375 |
| <i>Jung-Yeon Seo, Jinho Won Won, Yongjin Cho, Ok-Ran Park, Dae-Cheol Kim</i> | |
| Optical Properties of Cotton and Foreign Materials in the Wavelength Range from 400 to 2400 Nm | 383 |
| <i>Xiang Qiu, Sanhui Wang, Zhenxuan Zhao, Shicheng Hong, Mengyun Zhang</i> | |
| Contribution of New and Legacy Phosphorus from Organic and Inorganic Fertilizers in Subsurface-Drained Fields Using Machine Learning..... | 392 |
| <i>Emeka Franklin Felix Aniekwensi, Ehsan Ghane</i> | |
| Machine Learning Models for Estimating Optimum Top-Dressing Amount from NDVI, Weather Data, and Projected Yield and Grain Qualities | 414 |
| <i>Oyetayo Olukorede Oyebode, Masamoto Chiba, Takashi Yokoi, Hisato Katayama, Hiroyuki Nakagawa, Yusuke Yanagisawa</i> | |
| Field Evaluation of a Photoclectric Sensor Based Real-Time Grain Yield Monitor..... | 421 |
| <i>Abdul Momin, Avery Jenkins, James Baier, Braden Wyatt</i> | |
| Active Implement Steering Performance for Hitch and Wheeled Steering | 428 |
| <i>Travis A Burgers, Ansh V Rao, Luke P Pucket</i> | |
| Hydro-Informatics Driven Onsite Water Reuse: Advancing the One Water Concepts for Increasing Water Availability and Climate Resiliency | 437 |
| <i>R K Srivastava, A R Jantrania, J E Wolfe, A R Rubin</i> | |
| Development and Laboratory Assessment of Cutting and Snapping Mechanisms for Green Asparagus Harvesting..... | 442 |
| <i>Naseeb Singh, Yuzhen Lu</i> | |

| | |
|---|-----|
| Soybean-PCMAE: Perturbation Consistent Masked Autoencoders for Few-shot Segmentation of 3D Soybean Point Clouds..... | 452 |
| <i>Yu Tian, Xintong Jiang, Jan Franklin Adamowski, Shangpeng Sun</i> | |
| AI-Driven Plant Tracking and Segmentation for Precise Canopy Estimation in Strawberry Field..... | 462 |
| <i>Zijing Huang, Won Suk Lee, Minh Dat Le</i> | |
| A Comparative Analysis of Computer Vision Algorithms for the Classification of Goat Behavior | 475 |
| <i>Daniel Alexander Mendez, Blanca Fajardo Viloria, Eliseo Gil Vidal, Salvador Calvet, Andrea Costantino</i> | |
| Multimodal Data Integration for Predicting Cattle Behavior Using Transformer-Based Models | 483 |
| <i>Regina Eckhardt, Reza Arablouei, Kieren McCosker, Aaron Ingham, Heinz Bernhardt</i> | |
| Evaluating the Resilience and Sustainability of Diverse Crop Rotations with Long-Term Manure Management Under Future Climate Change in Eastern Canada | 488 |
| <i>Ruth C Sitienei, Zhiming Qi, Brian B Grant, Andrew C Vanderzaag, Guillaume Jego, Martin Chantigny, Marie-Elise Samson, Budong Qian, Ward N Smith</i> | |
| Transverse Distribution Accuracy of Agricultural Drones in the Application of a Cover Crop Mixture Compared to a Traditional Cover Crop Spreader..... | 512 |
| <i>Christine Stockel, Simon Jurgen Grebner, Heinz Bernhardt</i> | |
| On-Farm Processing and Marketing Models for Farmers of Developing Countries | 522 |
| <i>Sandeep Mann, Renu Balakrishnan, Soumya Mohapatra, Nachiket Kotwaliwale</i> | |
| Streamlining Dataset Development: a GUI for Automated Image Annotation in Wild Blueberry (<i>Vaccinium Angustifolium Ait.</i>) with Multimodal Optimization..... | 534 |
| <i>Connor C. Mullins, Travis J. Esau, Riley Johnstone</i> | |
| Stored Grain: a New View..... | 543 |
| <i>Larry D Howlett</i> | |
| Finite Element Modeling of ATV Stability in Agricultural Settings..... | 548 |
| <i>Payam Farhadi, Farzaneh Khorsandi</i> | |
| Effectiveness of Operator Protection Devices in Mitigating ATV Rollover Injuries | 551 |
| <i>Payam Farhadi, Farzaneh Khorsandi</i> | |
| Characterizing High Pressure Phase Transitions of Gelatin Gel and Assessing Properties Following Pressure Shift Freezing and Ice I to Ice III Phase Transition..... | 555 |
| <i>Ting Xiao, Yuxiao Mao, Hosahalli Ramaswamy, Songming Zhu, Sinan Zhang, Yong Yu</i> | |
| Path Planning and Control Method for Autonomous Tractor Based on High Definition Map | 574 |
| <i>Xingyu Gao, Weixin Zhai, Yonghao Liang, Yuhua Jiang, Chenggao Chu, Chentao Wu, Zunyuan Fu, Honggang Deng, Cheng Zhai, Caicong Wu</i> | |
| 3D Non-Destructive Detection and Quality Prediction of Korla Fragrant Pears Using Hierarchical Point Cloud Registration and XGBoost..... | 581 |
| <i>Mingjuan Xie, Yankun Peng, Yongyu Li, Tianzhen Yin</i> | |
| Decoupling and Separation of Ractopamine and Clenbuterol Raman Signals in Mixtures Based on Peak Coupling Effects | 589 |
| <i>Tianzhen Yin, Yankun Peng, Yongyu Li, Kuanglin Chao, Jianwei Qin, Mingjuan Xie</i> | |
| Friction Reduction in Ploughing by Air Lubrication | 595 |
| <i>Julius Ignatz Wendling, Heinz Bernhardt</i> | |

| | |
|---|-----|
| Up-Skilling the Next Generation in Agricultural Engineering in Europe | 602 |
| <i>Christina Maria Sebald, Simon Grebner, Martin Mayr, Vladana Vidric, Andreas Mandler, Lorenzo Becce, Christina Paulus, Giovanni Carabin, Fabrizio Mazzetto, Heinz Bernhardt</i> | |
| Assessing TensorRT Optimization for Real-Time Object Detection in Agriculture | 607 |
| <i>Adeayo Adewumi, Dharmendra Saraswat</i> | |
| Corn Flood Severity Evaluation by Integrating UAV-Based Multispectral Image | 625 |
| <i>Di Song, Mohammed Kamruzzaman</i> | |
| Neural Radiance Fields for Plot-Level Cotton Crop Three-dimensional Reconstruction and Yield Estimation..... | 631 |
| <i>Lizhi Jiang, Changying Li, Peng W Chee, Longsheng Fu</i> | |
| Development of Orchard Robot Control System Using ROS 2 | 645 |
| <i>Connor J Ruybalid, Christian M Salisbury, Allison Verner, Duke M Bulanon</i> | |
| Agricultural Injury Surveillance Using the Florida Trauma Registry..... | 654 |
| <i>Madison W Moore, Serap Gorucu, Nikolay Bliznyuk</i> | |
| Full-Scale Implementation of Coagulant Dosing for Recalcitrant Nitrogen and Orthophosphate Control During Dewatering of Thermal Hydrolysis Pretreatment-enhanced Anaerobic Digester Sludge..... | 659 |
| <i>Yitao Li, Malcolm Taylor, Caroline Nguyen, John Novak, Zhiwu Wang</i> | |
| PlantSAM: Towards Real-Time Plant Segmentation with Efficient Vision-Language Foundation Models | 664 |
| <i>Daniel J Petti, Changying Li, Alina Zare</i> | |
| Effect of Radio Frequency Cold Plasma on Secondary Structure of Pea Protein IsolateÂ | 679 |
| <i>Jawadul Misir, Kumar Mallikarjunan, George Annor</i> | |
| The Accuracy of Remote Sensing Technologies for Tree Height Estimation: a Comparative Evaluation in Citrus Orchards | 695 |
| <i>Wenhao Liu, Yiannis Ampatzidis, Benjamin Wilkinson</i> | |
| Moisture Regain Detection of Seed Cotton Using Information Fusion..... | 704 |
| <i>Yifu Qian, Mengyun Zhang, Liang Fang, Hongwei Duan, Ruoyu Zhang</i> | |
| Optimizing Irrigation Scheduling Using Deep Reinforcement Learning and Crop Growth Model | 715 |
| <i>Jiamei Liu, Jiahong Yang, Xinyi Jie, Fangle Chang, Longhua Ma, Hongye Su</i> | |
| Enhancing Tractor Stability Through Active Suspension: a Comparative Study of Actuator Heights | 725 |
| <i>Jinho Son, Seokho Kang, Hyunggyu Park, Yujin Han, Juhee Lee, Wonyeol Choi, Yushin Ha</i> | |
| DRS-Based PLSR Model for Predicting Soil Organic Matter Under Different Moisture Conditions in Saline and Non-saline Paddy Soils..... | 729 |
| <i>In Seop Jang, Junyoung Han, Dae-Cheol Kim, Yongjin Cho</i> | |
| Evaluation of Interpolation Accuracy of Soil Properties in Paddy Fields According to Variogram Models..... | 737 |
| <i>Sun-Bin Min, June-Young Han, Dae-Cheol Kim, Yongjin Cho</i> | |
| Developing an Image-Text System for Pest and Disease Identification for Vegetable Crops in Urban Community Farming | 746 |
| <i>Chiao-Chi Hsu, Ting-Ting Li, Ya-Ching Yang, Shih-Fang Chen</i> | |

| | |
|---|-----|
| Automated Detection of Farrowing Events in Commercial Pig Farms Using Deep Learning | 752 |
| <i>Wen-Liang Chu Wang, En-Chung Lin, Yan-Fu Kuo</i> | |
| Identifying Wood Species Using Macroscopic Images and Deep Learning | 756 |
| <i>Pei-Chi Yang, Chin-Mei Lee, Yan-Fu Kuo</i> | |
| Monitoring Chicken Farms Using Smart Rail Surveillance System and Deep Learning | 763 |
| <i>Kai-Rong Chang, Yan-Fu Kuo</i> | |
| Quantitative Phenotyping of Water-Stressed Tomato Plants Using Frequency-Domain Fluorescence Lifetime Imaging Microscope (FD-FLIM)..... | 772 |
| <i>Cheng-Hao Lin, Jiun-Wei Yi, Hsiao-Mei Wu</i> | |
| Utilizing Public Data for Annual Crop Yield Prediction: a Possibility Study | 783 |
| <i>Seokho Kang, Hyunggyu Park, Jinho Son, Yujin Han, Juhee Lee, Wonyeol Choi, Yushin Ha</i> | |
| Attitude Control of VTOL Based on Deep Reinforcement Learning for Bushfire Management | 788 |
| <i>Xinyi Jie, Jiahong Yang, Jiamei Liu, Fangle Chang, Jingbao Lu, Longhua Ma, Hongye Su</i> | |
| Non Destructive Testing Method for Lamb Shelf Life Based on Multimodal Data Fusion | 799 |
| <i>Qi Zhang, Peilin Jin, Renzhong Niu, Zhigang Li, Xiaoshuan Zhang</i> | |
| Development of a Deep Learning-Based Recommendation System for Coffee Blending Ratios Optimization..... | 807 |
| <i>Chih-Yun Tsai, Yu-Tang Chang, Shu-Ping Hung, Chun-Ming Lu, Shih-Fang Chen, Chia-Hung Peng</i> | |
| Identifying Yellow Hawkweed in Wild Blueberry Fields Using Drone Images for Site-Specific Herbicide Application..... | 817 |
| <i>Chloe L Toombs, Travis J Esau, Qamar U Zaman, Yunfei Jiang, Lily Calderwood</i> | |
| Economics of Small- Vs. Large-Scale Production Platformsin Row Crop Agriculture | 823 |
| <i>Christopher R Dean, Von Herron, Chris Tkach, Andrew A Klopfenstein, Alex Parsio, Robert Bench, Rohit Anand, John Fulton, Scott Shearer</i> | |

VOLUME 2

| | |
|--|-----|
| Using a Robotic Platform for Canopy-Wise Sequential Defoliation in Cotton and Its Effect on Fiber Quality | 835 |
| <i>Aashish Karki, Michael Marshall, Van Patiluna, Gilbert Miller, Jun Luo, Edward Barnes, Matthew Cutulle, Joe Mari Maja</i> | |
| AI-Driven Multimodal Framework for Predicting Strawberry Performance and Insights | 843 |
| <i>Liyike Ji, Xu Wang, Kalara Dissanayake, Shinsuke Agehara, Daeun Choi</i> | |
| Cross-Facility Reliable Deep Learning Based Beef Marbling Assessment Via Unsupervised Domain Adaptation Regression | 863 |
| <i>Samuel Vinson, Dongyi Wang</i> | |
| Point Cloud and Multi-View Deep Learning Approach for Poultry Weight Prediction..... | 871 |
| <i>Chung-Liang Chang, Rui-Yi Xu</i> | |
| CO ₂ -Reduction in Agricultural Logistics - HVO as Alternative to Diesel?..... | 878 |
| <i>Simon Grebner, Christine Stockel, Heinz Bernhardt</i> | |

| | |
|--|------|
| Real-Time Weed Species Localization and Tracking for Intra-Row Weed Density Estimation in Apple Orchards..... | 884 |
| <i>Lawrence Arthur, Sajjad Mahnan, Long He, Magni Hussain, Paul Heinemann, Caio Brunharo</i> | |
| Multicell Pair Shock-Wave Electrodialysis for Recovering Nutrients and Chemicals from Waste Streams..... | 904 |
| <i>Yu-I Lin, Po-Chih Tseng, Yupo J Lin, Shu-Yuan Pan</i> | |
| Integrating Micro-Hyperspectral Imaging and Mie Scattering for Early Detection of Microbial Contamination in Liquid Culture..... | 910 |
| <i>Libin Wu, Haiyong Weng, Shangpeng Sun, Dapeng Ye</i> | |
| Mitigating Greenhouse Gas and Ammonia Emissions in Litter-Based Pig Farming with Microbial Consortia | 922 |
| <i>Felix Gobeil, Erika Yukari Nakanishi, Patrick Brassard, Mick Wu, Sebastien Fournel, Stephane Godbout</i> | |
| Smart Site-Specific Mechanical Weeding Robot..... | 937 |
| <i>Shafi Md. Istiak, Mohammad Aftabi Talam, Rafat Safayet, James Y Kim, Sulaymon Eshkabilov</i> | |
| Path Planning and Controller Development for UGVs..... | 948 |
| <i>Mohammad Aftabi Talam, Shafi Md. Istiak, Rafat Safayet, James Y Kim, Sulaymon Eshkabilov</i> | |
| Development of an Embedded System for Managing Operations with Agricultural Tractors | 958 |
| <i>Delorme Correa Junior, Carlos Eduardo Silva Volpato, Ronald Leite Barbosa, Diego Jose Carvalho Alonso</i> | |
| An End-To-End Deep Learning Framework for Multi-Scale Cross-Domain Weed Segmentation | 984 |
| <i>Nazia Hossain, Sadia Tasneem Rahman, Shangpeng Sun</i> | |
| Recycling Polymers to Make Greenhouses | 993 |
| <i>Patrick P. Brisebois, Lucas Ohmer, Simon Joncas, Claudiane M. Ouellet-Plamondon</i> | |
| Variation in Microstructure, and Quality of Large Yellow Croaker Frozen by Liquid Nitrogen Spray During Storage as Affected by Freezing Temperature, Sample Volume and Depth | 1000 |
| <i>Yuxiao Mao, Hosahalli S. Ramaswamy, Ting Xiao, Hongyue Li, Yong Yu, Songming Zhu</i> | |
| Prediction of Egg Albumen Content Using Hyperspectral Imaging and Machine Learning..... | 1022 |
| <i>Md Wadud Ahmed, Jason Lee Emmert, Mohammed Kamruzzaman</i> | |
| A High-Throughput Pipeline for 3D Reconstruction of Soybean Root System Architecture Using macro-CT Scanning..... | 1028 |
| <i>Xuehai Zhou, Marc-Antoine Chiasson, Liwen Han, Davoud Torkamaneh, Pierre Dutilleul, Shangpeng Sun</i> | |
| Multi-View Cotton Boll Counting Using Segmentation and Monocular Depth Estimation with Synthetic Data | 1041 |
| <i>Chenjiao Tan, Rui Xu, Changying Li</i> | |
| High Quality Dataset for Learning Models | 1054 |
| <i>Zachary J Steigauf, Shubham Thapa, Umamaheswara R Tida, James Y Kim</i> | |
| Accurate Pixel-Wise Object Detection Framework for Aerial Imagery | 1062 |
| <i>Upama S Mahato, Navya Goli, Umamaheswara R Tida, James Y Kim</i> | |

| | |
|---|------|
| Optimizing Efficiency for Autonomous EV Robot | 1073 |
| <i>Seungyun Baek, Mohammad Aftabi-Talami, Sulaymon Eshkabilov, Yongjoo Kim, James Y Kim</i> | |
| Nutrient Dynamics and Retention in Fire-Affected Soils Treated with Engineered Fungal Mycelia Growth..... | 1082 |
| <i>Lune Martin, Henry Nakaana, Emmanuel Salifu</i> | |
| Digital Twin Method for Lifetime Prediction of Critical Components in Drip Irrigation Tape Production Line | 1088 |
| <i>Renzhong Niu, Zhigang Li, Qi Zhang, Peilin Jin</i> | |
| Application of Two Computer Vision Models on Commercial Finishing Pig Novel Data..... | 1099 |
| <i>Mekali S Felton, Feidra Gjata, Tawni Williams-Stroud, Anu Agarwal, Angela Green-Miller</i> | |
| Analysis of Influencing Factors on Cross-Regional Harvester Flows in China Based on Big Trajectory Data | 1108 |
| <i>Jia-Wei Xu, Cheng Fu, Cai-Cong Wu</i> | |
| Developing a Model Food for Large Yellow Croaker Muscle by Adjusting the Concentration of Components in Gelatin Gels..... | 1113 |
| <i>Yuxiao Mao, Hosahalli S. Ramaswamy, Ting Xiao, Hongyue Li, Yong Yu, Songming Zhu</i> | |
| 3D Point Cloud Preprocessing for High-Quality Crop 3D Modeling..... | 1134 |
| <i>Dokyun Jung, Seong-Hwan Lee, Yeong-Jin Kim, Woo-Joo Choi, Ki-Su Park, Myongkyoon Yang</i> | |
| Deep Learning-Based Reconstruction of Specific Spectral Band Images Using RGB Images | 1139 |
| <i>Yeong-Jin Kim, Woo-Joo Choi, Ki-Su Park, Seong-Hawn Lee, Dokyun Jung, Myongkyoon Yang</i> | |
| Cabbage Volume Estimation and Water Stress Monitoring Using Combined UAV and Ground-Based Multispectral and Thermal Imaging Approaches..... | 1148 |
| <i>Md Nasim Reza, Kyu-Ho Lee, Sun-Ok Chung</i> | |
| RY Sense: an Automated Tool for Rapid Yield Prediction of UAV-Based Remotely Sensed Data for Field-Based Breeding Programs | 1156 |
| <i>Aashvi Dua, Ajay Sharda, William T. Schapaugh, Rene Hessel</i> | |
| Instance Segmentation for Korean Melon (Chamoe) Cultivation Using YOLOv11 as a Step Toward Quadruped Robot Harvesting | 1167 |
| <i>Dohyeon Lee, Dongseok Shin, Soonduk Kwon, Seungun Ha, Chang Hyeon Baek, Hyun Kwon Suh</i> | |
| Novel Cannibalism Indices of Grouper Juvenile in High-Density Aquaculture Using Density Map and Optical Flow | 1173 |
| <i>Ting-En Lin, Yin-Hao Lai, An-Chi Liu, Feng-Jie Su, Cheng-Yin Chou, Joe-Air Jiang</i> | |
| Comparison of Conventional Drip and Microsprinkler Irrigation in Citrus Production Systems on Florida Sandy Soils..... | 1185 |
| <i>Kondwani Kamsikiri, Alisheikh Atta, Davie M Kadyampakeni</i> | |
| Design and Fabrication of Ergonomic Auxiliary Handles for Agricultural Tools | 1198 |
| <i>Felix Michael Ogueche, Jianfeng Zhou, Karen E Funkenbusch, Marcia C Shannon, Noel Aloysius, Teng Teeh Lim</i> | |

| | |
|--|------|
| Integrated Observer-Based Kalman Filter and LQR Control with Lyapunov Stability Analysis for Tractor-Trailer Systems | 1211 |
| <i>Zi-Hao Zhang, John K. Schueller, Jane Jaejeong Shin</i> | |
| Mobile Biomass-To-Fuel Harvester Design | 1230 |
| <i>Konnor G. Hole, John K. Schueller</i> | |
| A Synthetic Vision System for Accurate 3D Mushroom Pose Estimation Using Multi-View RGB-D Fusion | 1244 |
| <i>Fan Wu, Wengqiao Yuan</i> | |
| Optimal Weight Distribution of a Quarter Scale Tractor | 1252 |
| <i>Kenton R Simonson, Scott D Noble</i> | |
| Analyzing the Static and Dynamic Stability of a 110 kW Hydrogen Fuel Cell Tractor Using Simulation | 1265 |
| <i>Yujin Han, Seokho Kang, Jinho Son, Juhee Lee, Hyunggyu Park, Wonyeol Choi, Yushin Ha</i> | |
| Development of Wireless Monitoring and Automated Aeration Control System for Sugar Beet Conditioning in Outdoor Piles | 1267 |
| <i>Senthilkumar Thiruppathi, Shubham Subrot Panigrahi, Mohit Singla, Chandra Bhan Singh</i> | |
| Analysis of Irrigation Challenges for Mechanized Garlic Cultivation in South Korea | 1276 |
| <i>Hyunggyu Park, Wonyeol Choi, Jinho Son, Yujin Han, Juhee Lee, Seokho Kang, Yushin Ha</i> | |
| Big Data-Based Entropy of Wheat Combine Harvester for Cross-regional Operation | 1278 |
| <i>Shuo Liang, Xingyu Gao, Jiawei Xu, Caicong Wu</i> | |
| Optimization of GWL Margin to Enhance Planter Performance | 1288 |
| <i>Simran Dua, Bhaskar Aryal, Jose Peiretti, Ajay Sharda</i> | |
| Effect of Duct and Nozzle Geometry on Suction Pressure for Conveying Materials Using Air Jet Pumps | 1298 |
| <i>Michael Boyko, David Sumner, Lope Tabil, Martin Roberge</i> | |
| Computational Fluid Dynamics Analysis of Phosphine Gas Distribution for Effective Fumigation in Grain-Filled Barrel | 1308 |
| <i>Adri Das, Marvin Petingco, Mingjun Wei, Daniel Brabec, Mark Casada, Erin Scully, Deanna Scheff, Tanja McKay</i> | |
| A Dual-Platform Approach to Methane Emission Monitoring in Feedlots Using Open-Path Lasers and UAVs | 1315 |
| <i>Sushree Sangita Dash, Trevor W. Coates, Chandra A. Madramootoo</i> | |
| Engaging with Communities in the Global South to Address Climate Change | 1322 |
| <i>Claudiane Ouellet-Plamondon, Sergio Roberto Andrade Dantas, Diego Ramirez-Cardona, Carolina Moreno Londono</i> | |
| Development of TOMATO: a Deep Learning-Based Temporal Observation and Monitoring System for Automated Tomato phenomics | 1329 |
| <i>Ssu-Chi Chen, Zi-Heng Jian, Ya-Ping Lin, Shih-Fang Chen</i> | |
| An Intelligent Robot Based on Optimized YOLOv111 for Weed Control in Lettuce | 1342 |
| <i>Rui-Feng Wang, Yu-Hao Tu, Xue-Chen Li, Zi-Qiu Chen, Chang-Tao Zhao, Ce Yang, Wen-Hao Su</i> | |

| | |
|--|------|
| Computer Vision-Based Phenotyping and Yield Prediction in Soybean | 1350 |
| <i>Qi-Yuan Zhang, Lan-Qi Sun, Alireza Sanaifar, Jin-Hua Qiao, Yao-Yao Fan, Ce Yang, Kai Guo, Wen-Hao Su, Zhixi Tian</i> | |
| RZWQM2 Performance in Simulating Maize Yield and Evapotranspiration Under Rainfed and Irrigated Conditions..... | 1357 |
| <i>Viveka Nand, Zhiming Qi, Liwang Ma, Ward N. Smith, Elizabeth Pattey, Bruce A Kimball, Andrew E Suyker, Steven R Evett, Harmanpreet Singh Grewal</i> | |
| Turning Cannabis Waste into High-Value Products: Chemical Treatment and Characterization of Recreational Cannabis Stems | 1379 |
| <i>Pabitra Chandra Das, Ravi Patel, Amin Babaei-Ghazvini, Bishnu Acharya, Oon-Doo Baik, Lope G. Tabil</i> | |
| Machine Learning-Based Non-Destructive Classification of Tilapia Flesh Using Spectroscopic Techniques..... | 1392 |
| <i>Pin-Wei Chen, Yu-Hsin Chiu, Shih-Fang Chen</i> | |
| Rapid Detection of Protein Content in Mycelium Using Near-Infrared Spectroscopy and Chemometrics..... | 1399 |
| <i>Jin-Hua Qiao, Ding-Rong Kang, Mohammed Kamruzzaman, Douglas F. Barbin, Wen-Hao Su</i> | |
| Quadruped Robot Walking Stability and Korean Melon (Chamoe) Damage Risk During Transport in Simulated Greenhouse Environment Using Bullet Physics Engine | 1407 |
| <i>Hyeonji Park, Eungyu Lee, Soonduk Kwon, Dongseok Shin, Jinwon Kim, Seoung Taek Sung, Chang Hyeon Baek, Dongkyu Lee, Hyun Kwon Suh</i> | |
| Precision Pest Monitoring in Asparagus Greenhouses Using Deep Learning and IoT..... | 1412 |
| <i>Po-Shao Chen, Zhen-Yu Lian, Joe-Air Jiang, Li-Yu Liu, Ming-Hsien Hsieh, Jui-Chu Peng, Ming-Chi Guo, Cheng-Ying Chou</i> | |
| Eco-Friendly Extraction and Characterization of Terpenoids as Functional Food Ingredients: A Review..... | 1419 |
| <i>Ameen Hammed, Nushrat Yeasmen, Valerie Orsat</i> | |
| Leveraging Technology for Enhancing Irrigation Management in the Colorado River Basin of Utah for a Water-Secure Future..... | 1458 |
| <i>Silas Ekadu, Burdette Barker Barker, Matt Yost, Elisa Flint</i> | |
| Simulation-Based Optimization of Path Planning and Task Assignment for Fruit Harvesting in Dual-type Robotic Arm Collaboration..... | 1474 |
| <i>Chung-Liang Chang</i> | |
| Monitoring Land Use Changes in the Headwaters of the Karkheh River in Southwestern Iran | 1484 |
| <i>Zohreh Khorsandi Kouhanestani, Farhad Mokhtari, Farzaneh Khorsandi</i> | |
| Simultaneous Recovery of Nitrogen and Phosphorus from Poultry Litter Digestate Via Integrated Electrolytic Struvite Precipitation and Ammonia Scrubbing..... | 1487 |
| <i>Robinson Junior Ndeddy Aka, Hossain Md Mokter, Dinithi Mohotti, Alia Nasir, Ekow Agyekum-Oduro, Sarah Wu, Jun Zhu</i> | |
| High-Resolution Drone Imagery and Machine Learning for Predicting Soybean Grain Quality..... | 1503 |
| <i>Blessing Abraham Ademola, Jianfeng Zhou, Fengkai Tian, Guojie Ruan</i> | |
| Modeling Drainage Flow and Phosphorus Losses in a Tile-Drained Field in Sweden Using RZWQM2-P | 1512 |
| <i>Jinyu Wen, Zhiming Qi, Jian Liu, Helena Aronsson, Hui Liu, Xiulu Sun</i> | |

| | |
|---|------|
| Design of a Wireless Temperature Data Acquisition System for Monitoring Egg Temperatures During Thermal Inactivation of the HPAI Virus..... | 1529 |
| <i>Samuel Beffa, Michael Cheadle, Ethan Burton</i> | |
| Electrifying Agriculture: Evaluating Tractor Electrification with a Data-Driven Approach | 1539 |
| <i>Massimiliano Varani, Michele Mattetti, Francesco Pio Intrevado</i> | |
| Design and Testing of Forced-Hot Air Furnaces to Thermally Inactivate the HPAI Virus in Packaged and Unpackaged Shell Eggs at Large-Scale Poultry Facilities..... | 1549 |
| <i>Ethan D Burton, Gregory F Nellis, Michael Cheadle, Sam Beffa</i> | |
| Multispectral2thermal: a GAN-Base Architecture for Multimodal Color-to-thermal Image Translation in Agriculture Field..... | 1562 |
| <i>Liyan Wang, Liujun Li, Kwaku Opoku-Ware, Boyu Zhang</i> | |
| In Field Canola Flea Beetle Damage Estimation Based on High-Resolution Multimodal Imaging and Deep Learning | 1571 |
| <i>Md Sabid Hasan, Liujun Li, Kamal Khadka, Subodh Adhikari</i> | |
| Development of Internet of Things (IoT) Enabled Device for Environmental Control in Livestock Structures..... | 1581 |
| <i>Daniel Ayanfe Ajayi, Timothy Oluwasanmi Sijuade, Israel Alabi, Mobolaji Oluyimika Omobowale</i> | |
| Economic, Environmental, and Human Benefits of GPS-Guided Autosteer in Grain Seeding..... | 1587 |
| <i>Hannu Haapala, Janne Kalmari, Konsta Sarvela, Petri Linna, Ilta Appelgren</i> | |
| Automated Weed Pressure Measurement System Evaluation for Unmanned Aerial Vehicles | 1594 |
| <i>Md. Nurul Azmir, Akwasi Tagoe, Cengiz Koparan, Nilda Roma Burgos, Jason Davis, Benjamin Runkle, Dongyi Wang</i> | |
| An Automated LED Intervention System for Poultry Piling | 1603 |
| <i>Benjamin Smith, Yunfei Long, Daniel Morris</i> | |
| Robust 3D Apple Localization in Robotic Harvesting Using Deep Learning and Spatial Clustering | 1611 |
| <i>Siddhartha S Bhattacharya, Chaaran Arunachalam, Kaixiang Zhang, Jiajia Li, Renfu Lu, Zhaojian Li</i> | |
| Enhanced Piglets Monitoring with a Multiview Camera System..... | 1626 |
| <i>Xiao Yang, Anil Bhujel, Mk Bashar, Madonna Benjamin, Daniel Morris</i> | |
| Detection of Downy Mildew in Arugula Using Spectral Analysis and Machine Learning | 1635 |
| <i>Bennett Morris, Jenna Keller, Bo Liu, Shunping Ding</i> | |
| Detection of Downy Mildew in Arugula Using Modified YOLO Semantic Segmentation with Hyperspectral Imaging and Downy Mildew Index..... | 1645 |
| <i>Bennett Morris, Jenna Keller, John Joseph Urrutia, Bo Liu, Shunping Ding</i> | |

Author Index