

7th World Congress on Computers in Agriculture and Natural Resources 2009

(WCCA 2009)

**Reno, NV, USA
22 – 24 June 2009**

ISBN: 978-1-61567-390-2

Printed from e-media with permission by:

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

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

Copyright© (2009) by American Society of Agricultural & Biological Engineers
All rights reserved.

Printed by Curran Associates, Inc. (2009)

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

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

hq@asabe.org

TABLE OF CONTENTS

CONTROL, DATA, ACQUISITION, MONITORING AND SENSING

An Online Humidity Transducer Based on Nearinfrared Radiation	1
<i>Diogo K. Takayama , José A. de França, Dari O. Toghinho Filho , Maria B. de Moraes França, Marcelo G. Canteri</i>	
Anemometer 3D Based on Ultrasound	7
<i>Marcela H. Koyama, Rodger V. Pereira, Tiago P. da Silva, José A. de França, Marcelo G. Canteri, Dari O. Toghinho Filho, Brazil</i>	
System of Microstations of Data Acquisition for Wireless Monitoring of the Microclimate in Crop Areas	13
<i>José A. de França, Edson L. Burgo Júnior, Marcela H. Koyama, Rodger V. Pereira, Marcelo G. Canteri , Maria B. de Moraes França</i>	
Developing a Wireless Infrared Thermometer with a Narrow Field of View	19
<i>Susan A. O’Shaughnessy, Martin A. Hebel, Steven R. Evett</i>	
Evaluation of Sensor Readability and Thermal Relevance for RFID Temperature Tracking	25
<i>C. Amador, J.P. Emond</i>	
Low Cost Technology Applied to Thermometry of Grains	32
<i>Marcelo Ferrasa, Marco Antonio Martin Biaggioni, Marcelo Giovaneti Canteri</i>	
Automatic Monitoring of Turkeys: A VisionBased Approach to Detect and Analyse the Behaviour of Turkeys in Transport Cages Based on Ellipse Fitting	38
<i>Ahmad Poursaberi, Anette Wichman, Claudia Bahr, Laura Hänninen, Matti Pastell, Daniel Berckmans</i>	
Synchronized Recording of Pressure Distribution and Posture for Automatic Lameness Detection in Dairy Cattle	45
<i>Arno Pluk, Claudia Bahr, Ahmad Poursaberi, Willem Maertens, Annelies Van Nuffel, Jurgen Vangeyte, Bart Sonck, Daniel Berckmans</i>	
Estimating Broiler Breeder Welfare Using Image Analysis	51
<i>Irenilza A. Naas, Marcus Laganá, Mario Mollo Neto</i>	
PlayStation3 vs Pentium PC for Optical Fruit Calibration	57
<i>Nicolás Narria, Per Bj. Bro,</i>	
Automatic Inspection Using Machine Vision for Food Safety Control	63
<i>Chun Chieh Yang, Kuanglin Chao, Moon S. Kim</i>	
SMART Irrigation System Controllers	73
<i>Edward M. Norum, Diganta Adhikari</i>	

EDUCATION AND LEARNING

Lyra Virtual World Environment (Lyra VWE): Educational Applications in Agriculture and Natural Resources	76
<i>Howard W. Beck</i>	
Advantages of Open Source Based Elearning Tools in the Collaboration and Training in the Agricultural Education	82
<i>Miklós Herdon, László Várallyai, Peter Lengyel</i>	
Developing High Quality Online Learning Environments	89
<i>F. S. Zazueta, A. Allen, J. Smith, K. Kirmse, R. Williams</i>	
Multidisciplinary Aspects of Learning Information Technology in Accredited Agricultural Education Programs	98
<i>Miklós Herdon, László Várallyai</i>	
Online Learning Resources on Agricultural Topics: the Case of Organic Agriculture & Agroecology	105
<i>Nikos Manouselis, Nikos Palavitsinis, Xenofon Tsilibaris</i>	

WEB SERVICES, PORTALS, INTERNET AND WEB 2.0 APPLICATIONS

The Role of Intermediaries in the Success of Electronic Claiming for Farm Subsidies in Hungary	110
<i>Miklós Herdon, Mihály Csótó</i>	

Specification of SOA Components and Web Services to Integrate Ecological Niche Modelling Systems and IABINPTN	114
<i>R. L. Stange, B. Buani, F. S. Santana, P. L. P. Correa, A. R. Hirakawa, A. M. Saraiva</i>	
Reengineering Research Organizations with Web 2.0 Tools	120
<i>Humphrey Keah</i>	

FOOD SAFETY CONTROL/TRACKING-TRACING

Integrative Information Management Across Different Surveillance Areas: The Power of Classification Systems and a Need for Institutional Change	136
<i>Johannes Otto, Matthias Frost, Reiner Doluschütz</i>	
Tracking Pests and Plant Diseases through Space and Time Using Geotagged Digital Images	142
<i>Jiannong Xin, Carrie L. Harmon, Pete Vergot III, Huafeng Jin</i>	
Towards Developing a Edible Fungi Factory HACCP MIS Based on RFID Technology	148
<i>Wang Yunsheng, Wan Changzhao, Cheng Jihong, Guo Qian, Yang Juan, Zhao Jingyin</i>	

MODELING AND SIMULATION

AQUARIUS: A Simulation Program for Evaluating Water Quality Closure Rules for Shellfish Industry	154
<i>F. S. Conte, A. Ahmadi</i>	
Assessment of Water Quality Calibration Criteria for FieldScale Water Quality Model	159
<i>Sang Min Kim, Choung Hyun Seong, Seung Woo Park</i>	
Development of a Distributed Artificial Neural Network for Hydrologic Modeling	164
<i>R.A. Logsdon, S.G. Bajwa, V. Vibhava</i>	
Investigation of Head Loss along Drip Emitter Channel by Using Computational Fluid Dynamics	170
<i>Lu Gang, Wei Qingsong, Liu Jie, Shi Yusheng, Dong Wenchu</i>	
Modeling Top Soil Erosion and Mass Failures in Steep Agricultural Slopes: Integrating WEPP and a Landslide Model	178
<i>Thomas A. Cochrane, Govind Acharya</i>	
Simulate Regional PM10 Dust Dispersion from Agricultural Tilling Operations Using Hysplit4	184
<i>Junning Wang, Ted W. Sammis, David R. Miller, April L. Hiscox, David Granucci, Britt Holmén, John Kasumba</i>	
Applying Control Volume Finite Element for Modelling Direct Injection Boom Spraying Flow	190
<i>Abdellah El Aissaoui, Frederic Lebeau, Marie France Destain, Karim Houmy</i>	
Computer Simulation of Thermal Processing for Canned Food Sterilization	199
<i>R. Radrigán, J.A. Cañumir</i>	
Combined Use of Simulation Modeling and Linear Programming for Logistic Design of the Slurry Distribution Systems	207
<i>Patrizia Busato, Remigio Berruto</i>	
Mining Derived Weather Forecast Variables for Crop Disease Risk Prediction	215
<i>Jason Smith, Kathleen M. Baker, Robert Trenary</i>	
SOC & SOA in Ecological Niche Modelling and Agribusiness: Discussion and Case Studies	220
<i>Fabiana Soares Santana, Antonio Mauro Saraiva</i>	
Predicting the Impact of Supplemental Phytase, Wheat and Phosphorus on the Performance of Laying Hen	226
<i>Z. Forghany, M. Davarynejad, L. Zartash</i>	

INFORMATION SYSTEMS AND DATABASES

DiagText: A Text Mining Tool for Agriculture	232
<i>S. M. F. S. Massruhá, K. X. S. de Souza, H. P. de Lima, R. Ricciotti, A. D. L. Zanchetta</i>	
Principal Components Analysis in the Software AssisatStatistical Attendance	239
<i>Francisco de Assis Santos e Silva, Carlos Alberto Vieira de Azevedo</i>	
Compare Different Methods for Extensibility of Measurement Results of Point Samples of the Soil Protection Information and Monitoring System	243
<i>László Várallyai, Béla Kovács, Miklós Herdon</i>	

Bringing Farmers to the Market with 3Reforms and 3platform Technologies	249
<i>Asanee Kawtrakul, Vasuthep Khunthong, Thanaphat Suksaengsri, Patcharee Varasai, Amporn Poyai, Seksan Sartsatit, Anan Pusittigul, Kanok Lohapiyaphan, Srayut Tongnoy, Duangkaeo Pokawattana, Werachai Narkwiboonwong</i>	
Towards Cyberinfrastructure for Multiscale Crop Disease Early Warning Systems	254
<i>Kathleen M. Baker, Beth Plale, Ilya Zaslavsky, Suresh Marru</i>	
Developing Agricultural Research Information Systems: The Experience of the Global Forum on Agricultural Research	260
<i>Ajit Maru, Mark Holderness, Valeria Pesce</i>	
Dynamic Mapping, a Flash Solution	265
<i>Huafeng Jin, Jiannong Xin</i>	
RPP Rainfall Processing Program	270
<i>F. S. Conte, A. Ahmadi</i>	
Rural Amenity Survey and Evaluation	275
<i>Oh, Yun Gyeong, Choi, Jin Yong, Bae, Seung Jong, Lee, Sang Hyun</i>	

GEOGRAPHIC INFORMATION SYSTEMS

Analyzing the Spatial Centrality of Rural Villages for GreenTourism Using GIS and Social Network AnalysisFocusing on Rural Amenity and Human Resources	282
<i>Sang Hyun Lee, Jin Yong Choi, Seung Jong Bae, Yun Gyeong Oh</i>	
Study on Approaches of Land Suitability Evaluation for Crop Production Using Geographic Information System	289
<i>Li Linyi, Zhao Jingyin, Yuan Tao, Liu Zhaoli</i>	
GISbased Impact Assessment of Climate Change for Cropland Suitability in Korea	295
<i>Min Won Jang, Suk Young Hong, Yi Hyun Kim</i>	

PRECISION AGRICULTURE & WIRELESS SENSOR NETWORKS

Designing, Modeling and Controlling a Novel Autonomous Laser Weeding System	299
<i>E. S. Nadimi, K. J. Andersson, R. N. Jørgensen, Jørgen Maagaard, Solvejg Mathiassen, S. Christensen</i>	
Development of a Novel Safety System for Remote Plant Nursing Robots	304
<i>Jakob J. Larsen, E. S. Nadimi, Palle Hermansen</i>	
Simulated Slopes on a Test Rig Based Evaluating Continuous Cereal Yield Metering Accuracy	310
<i>Akbar Sanaei</i>	
Topology of a Network for Wireless Transmission of Data for Use in Precision Agriculture	318
<i>Alex L. Guedes, Maria B. de M. França, José A. de França, Marcela H. Koyama, Marcelo G. Canteri</i>	
Study and Development of an Integrated System for Slurry Management Monitoring and Electronic Reports Drawing up in Cattle Breeding	324
<i>F.M. Tangorra, S. Nava, E. Beretta, M. Lazzari</i>	
Advanced Distributed Monitoring System for Agriculture Based on Wireless Sensor Network Technology	330
<i>Luca Bencini, Giovanni Collodi, Davide Di Palma, Antonio Manes, Gianfranco Manes</i>	
Monitoring and Classifying the Behavior of a Herd of Sheep Using ad hoc Wireless Sensor Networks and Artificial Intelligence	336
<i>E. S. Nadimi, R. N. Jørgensen, V. Blanes Vidal, S. Christensen</i>	
Wireless Sensor Network to Estimate Streamflow in Channel Networks	342
<i>Christian Correa, Diego Rivera, Sergio Villagrán</i>	
Wireless Telemetry for Livestock Condition Monitoring	348
<i>Kae Hsiang Kwong, Hock Guan Goh, Tsung Ta Wu, Bruce Stephen, Craig Michie, Ivan Andonovic</i>	

TRACEABILITY, FOOD SAFETY AND MARKETING

Effects of Antenna Position on Readability of RFID Tags in a Refrigerated Sea Container of Frozen Bread at 433 and 915 MHz	355
<i>M. Laniel, J.P. Emond, A.E. Altunbas</i>	
Quality Assurance and Traceability of Foods of Animal Origin – Major Findings from the Research Project IT FoodTrace	361
<i>Reiner Doluschütz, Barbara Engler</i>	

Study and Development of an Integrated Automatic Traceability System for the Bovine Meat Chain	367
<i>S. Nava, F.M. Tangorra, E. Beretta, M. Lazzari</i>	

DECISION SUPPORT SYSTEMS

A Webbased Decision Support System for Surface Irrigation Design. Software Development	377
<i>José M. Gonçalves, André P. Muga, Luis Santos Pereira</i>	
A Website for Delivering Key Date Information to Farmers in Support of Legal Compliance	383
<i>M. Hennessy, N.M. Holden</i>	
From CyberBrain to Q&A Services: A Development of QuestionAnswering Services System for the Farmer through the SMS	389
<i>Asanee Kawtrakul, Mukda Suktarachan, Pathrawan Rattanamane, Patrick Saint Dizier, Sudarin Rodmanee, Saovakon Laovayanon, Decha Jenkollop, Anan Pusittigul</i>	
The Linear Programming Module of CAPRICORN Package: A Windows Program for Formulating and Evaluating Rations for Goats	396
<i>A. Ahmadi, P.H. Robinson</i>	
Selecting a Cattle Food Supplier as a Group DecisionMaking Problem	401
<i>Z. Srdjevic, S. Trivunovic, B. Srdevic, T. Zoranovic</i>	
Development of Decision Support System for Sustainable Crop and Water Management in Rainfed Areas in the Philippines	405
<i>Orlando F. Balderama</i>	
Interfacing CCFARM Simulation Engine with Microsoft Excel's VBA Engine to Generate OnDemand Outputs	412
<i>J. W. Oltjen, A. Ahmadi, A.J. Romera, D.J. Drake</i>	
Objective Evaluation of Walnut Cultivars by the Analytic Hierarchy Process	416
<i>Zorica Srdjevic, Bojan Srdjevic, Kosana Suvocarev</i>	

ADOPTION, EXTENSION AND RURAL DEVELOPMENT

The Open Academy for Philippine Agriculture (OPAPA): Enhancing Extension Services to the Farmers of Northern Philippines through Information and Communication Technologies(ICT)	423
<i>Orlando F. Balderama</i>	
The e-readiness of Hungarian Farmers	430
<i>Mihály Csótó</i>	
Web Customer Care: An Empirical Analysis of Italian Wine Companies	434
<i>Riccardo Vecchio</i>	
Rinfo - A One Stop Information System for Rural Development– a Prototype	440
<i>J. Adinarayana, D. Sudharsan, A K Tripathy</i>	
BrandVariety Performance Information System for Crops in India: A Study and Design for Cotton	447
<i>Vasant P. Gandhi</i>	

FARM MANAGEMENT

Managing My Total Acre: An Integrated Systems Approach to Farm Management	455
<i>Pradip K. Das, Beth A. Holmes, Greg E. Knoblauch</i>	
The Role of ISCADADA System and Specialized Software in Energy and Water Efficiency on a 104 Square km2 (40 ml2) LargeScale Drip Irrigated AgroForestry Farm	463
<i>Nabil Mohamed</i>	
An Agricultural Field Work Management System for Rural Farmers in Sri Lanka	470
<i>Jayasinghe, Masao Yoshida, Takemi Machida</i>	