Agenda

September 9, 2009
7:00 PM  Registration
           Welcome Reception—Technology Room

September 10, 2009
7:30 AM   Registration
8:30      Call for Meeting—Chancellor Ballroom
9:00      Keynote Address
9:45      Coffee Break
10:00     Session 1: Perception—Robotic Equipment Situation Awareness Sensing (1)—Lincoln Room
           Session 2: Biorobot Execution—Alma Mater Room
12:00     Lunch—Chancellor Ballroom
1:15      Session 3: Perception—Robotic Equipment Situation Awareness Sensing (2)—Lincoln Room
           Session 4: Biorobot Application Issues—Alma Mater Room
3:15      Coffee Break
3:30      Session 5: Robotic Applications to Specialty Crop Production—Lincoln Room
           Session 6: Crop Condition Sensing—Alma Mater Room
6:00      Dinner—Chancellor Ballroom

September 11, 2009
8:15 AM   Session 7: Guidance, Learning, and Planning—Lincoln Room
           Session 8: Crop Quality / Yield Sensing—Alma Mater Room
10:15     Coffee Break
10:30     Panel Discussion: Future of Bio-Production Automation Research—Chancellor Ballroom
12:00 PM  Lunch—Chancellor Ballroom
2:00      IFAC Committee Meeting
5:00      Cookout Gathering—Heritage Room, ACES Library
September 9, 2009

7:00 PM
Registration
Reception (Technology Room)

September 10, 2009

Opening Session (Chancellor Ballroom)
Chairperson: Dr. N. Noguchi, Hokkaido University, Japan

8:30 AM
Call for Meeting: Dr. Qin Zhang, Washington State University, USA

8:40 AM
Welcome Remarks: College of ACES Interim Dean Dr. Robert Hauser, University of Illinois at Urbana-Champaign, USA

9:00 AM
Keynote: The impact of bio-robotics to value-added worksite solutions
Dr. John Reid, Deere & Company, USA

9:45 AM
Coffee Break

Session 1: Perception—Robotic Equipment Situation Awareness Sensing (1) (Lincoln Room)
Chairperson: Dr. H. Murase, Osaka Prefecture University, Japan

10:00 AM
3D vision solutions for robotic vehicles navigating in common agricultural scenarios
F. Rovira-Mas*, Polytechnic University of Valencia, Spain

10:15 AM
An automated method to calibrate camera installation pose for stereovision-based vehicle navigation
Q. Wang, University of Illinois at Urbana-Champaign, USA; with Q. Zhang and F. Rovira-Mas

10:30 AM
Development of a tractor navigation system using augmented reality
Y. Kaizu, Hokkaido University, Japan; with J. Choi

10:45 AM
Video-based obstacle detection for coordinated machines
S.Y. Cheng, HRL Laboratories, USA; with M. Dialy, Y. Owechko, S. Medasani, and Z. Bonefas

11:00 AM
Wheat cut and uncut edge detection method based on wavelet image rotation and projection
S. Wang, China Agricultural University, China; with Y. Ding and Y. Tan

11:15 AM
A new algorithm of crop-row detection based on machine vision
R. Zhao, China Agricultural University, China; with M. Li, M. Zhang, and G. Liu

11:30 AM
A reconfigurable data collection vehicle for bioenergy crop sensing and management
Y. Xiong, University of Illinois at Urbana-Champaign, USA; with L. Tian and T. Ahamed

11:45 AM
Analysis of farmer’s information behavior to develop the farm data management system
N. Murakami, National Agricultural Research Center for Hokkaido Region, Japan; with A. Ito, T. Morishima, and K. Kouichi

Session 2: Biorobot Execution (Alma Mater Room)
Chairperson: Dr. L. Tian, University of Illinois at Urbana-Champaign, USA

10:00 AM
Supervisory control of multiple tractors in an orchard environment
S. Moorehead, Deere & Company, USA; with C. Ackerman, D. Smith, J. Hoffman, and C. Wellington

10:15 AM
An optimal force distribution algorithm for the legs of a hexapod walking robot
C. Chen, Zhejiang University, China; with B. Jin and W. Li

10:30 AM
Development of legged robot for shaft tillage cultivation—Proposal of basic concept
J. Tatsuno, Kinki University, Japan; with K. Tajima and K. Inagaki

10:45 AM
Automatic steering system for an electronic robot vehicle
O. Barawid, Hokkaido University, Japan; with N. Noguchi

11:00 AM
Positioning and control methods for vehicle automatic navigation
M. Guo, China Agricultural University, China; with G. Liu and Z. Liu

*boldface denotes presenting author; the others are contributing authors
**11:15 AM**
Development of low-cost and small-scale electronic robot vehicle for orchard application  
O. Barawid, Hokkaido University, Japan; with N. Noguchi

**11:30 AM**
Evaluation of a robotic peat moss harvesting system  
C. Ackerman, Deere & Company, USA; with D. Johnson

**11:45 AM**
Small turning behavior of an articulated vehicle by braking control  
M. Iida, Kyoto University, Japan; with H. Tomiyama, T. Oh, H. Nakashima, and T. Nakamura

**12:00 Noon**
Lunch (Chancellor Ballroom)

**Session 3: Perception—Robotic Equipment Situation Awareness Sensing (2)** (Lincoln Room)
Chairperson: Dr. J. Lenz, Deere & Company, USA

**1:15 PM**
Image geo-referencing method for a tower remote sensing system  
Y. Jiang, University of Illinois at Urbana-Champaign, USA; with L. Tian, T. Ahmed, Y. Zhang, and F. Pinto

**1:30 PM**
Acoustic tomography for temperature estimations of deep-sea hydrothermal vents  
W. Fan, Zhejiang University, China; with H. Pan, Y. Chen, Y. Pan, and J. Mao

**1:45 PM**
Mobile sensor network for monitor and assessment of aquatic environment of marine shellfish  
H. Yang, Zhejiang University, China; with Y. He and Y. Bao

**2:00 PM**
Field robot positioning by using remote sensing image  
Y. Zhang, University of Illinois at Urbana-Champaign, USA; with L. Tian, T. Ahmed, F. Pinto, and B. Zhao

**2:15 PM**
Adaptive thermal-reflectance stress imaging for thermophysiological quantification  
S. Ondimu, Osaka Prefecture University, Japan; with H. Murase

**2:30 PM**
Air flow control using wall-greening patterns  
J. Park, Osaka Prefecture University, Japan; with H. Murase

**2:45 PM**
Discrimination of varieties of tomato by space-flight breeding using visible/near infrared spectroscopy and chemometrics  
Y. Shao, Zhejiang University, China; with J. Shi and Y. He

**3:00 PM**
Nondestructive detection of nitrogen content in oilseed rape leaves  
F. Liu, Zhejiang University, China; with M. Huang and Y. He

**Session 4: Biorobot Application Issues** (Alma Mater Room)
Chairperson: Dr. M. Bergeman, Carnegie Mellon University, USA

**1:15 PM**
Development of tomato cluster harvesting robot  
N. Kondo, Kyoto University, Japan; with K. Yata, T. Shiigi, M. Iida, K. Yamamoto, M. Monta, M. Kurita, H. Omori, and H. Shimizu

**1:30 PM**
Connecting high level and low level controllers on robotic vehicles using a supporting architecture  
M. Cameron, Deere & Company, USA; with A. Greer and S. Moorehead

**1:45 PM**
Research on embedded wireless remote control system of agricultural mobile robot  
J. Chen, Northwest A & F University, China; with Q. Su and S. Lian

**2:00 PM**
Using orthogonal experimental design to optimize PID parameters for automatic combine header height control  
B. Jin, Deere & Company, USA; with Q. Zhang, A. Alleyne, and A. Greer

**2:15 PM**
Backstepping-based sliding mode control for an agricultural robotic vehicle  
X. Tu, Iowa State University, USA; with L. Tang

**2:30 PM**
A state-space model of the threshing and separation process in axial units  
T. Kraus, Katholieke Universiteit Leuven, Belgium; with M. Diehl, B. Missotten, J. De Baerdemaeker, and W. Saeys

**2:45 PM**
Development of Sunagoke moss response-based sensing for environmental control strategies  
Y. Hendrawan, Osaka Prefecture University, Japan; with H. Murase
3:00 PM
Load estimation of a manure spreader by an adaptive control observer
N. Murakami, National Agricultural Research Center for Hokkaido Region, Japan; with A. Ito and K. Kouichi

3:15 PM
Coffee Break

Session 5: Robotic Applications for Specialty Crop Production (Lincoln Room)
Chairperson: Dr. R. Lu, USDA–ARS, USA

3:30 PM
Automation for specialty crops: A comprehensive strategy, current results, and future goals
S. Singh, Carnegie Mellon University, USA; with T. Baugher, M. Bergerman, B. Grocholsky, et al.

3:45 PM
A laser rangefinder positioning for asparagus harvesting robot
T. Shiigi, Kyoto University, Japan; with N. Kondo, N. Taguchi, and H. Shimizu

4:00 PM
Development of an image segmentation algorithm for identification of overlapping tomatoes
R. Xiang, Zhejiang University, China; with H. Jiang, Y. Peng, and Y. Ying

4:15 PM
Preliminary results in comparing laser and stereo vision range sensing for tree canopy volume estimation
M. Swanson, Carnegie Mellon University, USA; with C. Dima and T. Stentz

4:30 PM
Computer vision technique for green citrus recognition in tree image
H. Okamoto, Hokkaido University, Japan; with W. Lee

4:45 PM
A multispectral imaging analysis for enhancing citrus fruit detection
D. Bulanon, University of Florida, USA; with T. Burks and V. Alchanatis

5:00 PM
Development of a tubing-grafting robot for fruit-bearing vegetable seedlings
Y.C. Chiu, National Ilan University, Taiwan; with S. Chen and Y. Chang

5:15 PM
Sorting tomato seedlings for grafting robot using machine vision
M. Ashraf, Kyoto University, Japan; with N. Kondo, T. Shiigi, H. Shimizu, and Y. Kohno

Session 6: Crop Condition Sensing (Alma Mater Room)
Chairperson: Dr. Y. He, Zhejiang University, China

3:30 PM
Satellite and aerial remote sensing for production estimates and crop assessment
I. Han-Ya, Hokkaido University, Japan; with K. Ishii and N. Noguchi

3:45 PM
Real time NDVI measurement using low-cost panchromatic sensor from a robotic platform
B. Zhao, University of Illinois at Urbana-Champaign, USA; with L. Tian, F. Pinto, C. Gadonna, T. Ahmed, and Y. Zhang

4:00 PM
Small grain crop density estimation using Lidar-sensors
B. Lenaerts, Katholieke Universiteit Leuven, Belgium; with G. Craessaerts, W. Saeyes, and J. De Baerdemaeker

4:15 PM
Detection of sudden death syndrome using multispectral imaging sensor
D. Cui, University of Illinois at Urbana-Champaign, USA; with Q. Zhang, M. Li, T. Slaminko, C. Bowen, and G. Hartman

4:30 PM
Non-destructive measurement of nitrate concentration in vegetables by near infrared spectroscopy
T. Matsumoto, Kobe University, Japan; with H. Itoh, Y. Shirai, N. Shiraishi, and Y. Uno

4:45 PM
Measurement of rice nitrogen stress based on multispectral image
Y. Shao, Zhejiang University, China; with Y. Bao, Y. He, and Y. Yang

5:00 PM
Measurement of nitrate concentration distribution in vegetables by hyperspectral camera
H. Matsuura, Kobe University, Japan; with H. Itoh, S. Kanda, N. Shiraishi, K. Sakai, and A. Sasao

5:15 PM
Weed detection using hyperspectral imaging in soybean field
Y. Suzuki, Hokkaido University, Japan; with H. Okamoto, T. Kataoka, and Y. Shibata

6:00 PM
Dinner (Chancellor Ballroom)
September 11, 2009

Session 7: Guidance, Learning, and Planning
(Lincoln Room)
Chairperson: Dr. F. Rovira-Mas, Polytechnic University of Valencia, Spain

8:15 AM
Region growing algorithm using object-featured sample base and its application to robotic guidance
L. Zhang, Zhejiang University of Technology, China; with Q. Yang, J. Wu, Y. Xun, F. Xu, F. Gao, G. Bao, and F. Jiang

8:30 AM
Spatial decision support systems as a means towards sustainable agriculture
C. Tuot, German Research Center for Artificial Intelligence, Germany; with A. Dengel

8:45 AM
Coordinated master-slave motion control for agricultural robotic vehicles
S. Vougioukas, Aristotle University of Thessaloniki, Greece

9:00 AM
Navigation of a crawler type vehicle by Q-learning and recurrent neural network
T. Soneda, Kyoto University, Japan; with M. Iida

9:15 AM
Navigation of agricultural robot using omnidirectional camera in grassland
R. F. Teimourlou, Hokkaido University, Japan; with N. Noguchi

9:30 AM
Evaluation of ultrasonic sensors as guidance sensors for greenhouse application robots
H. Masoudi, University of Tehran, Iran; with N. Noguchi, M. Omidi, R. Alimardani, S. S. Mohtasebi, K. Ishii, and S. B. Shooraki

9:45 AM
Application of a behavior-based control architecture for autonomous agricultural robots
S. Pitta, University of Kentucky, USA; with J. Luck and S. Shearer

10:00 AM
Electronic gene in mobile robotics
A. Delgado, National University of Colombia, Colombia

*boldface denotes presenting author; the others are contributing authors

8:30 AM
Monitoring rice growth environment by remote sensing
I. Han-Ya, Hokkaido University, Japan; with K. Ishii and N. Noguchi

8:45 AM
Prediction of internal quality of cherry tomato using GA and Vis/NIR spectroscopy
H. Yang, Zhejiang University, China; with Y. Bao and Y. He

9:00 AM
Machine vision-based detection of rice exterior feature parameters
Y. Wang, Shandong Agricultural University, China; with H. Gao, Q. Zhang, and P. Ge

9:15 AM
Nondestructive identification of cherry-tomato varieties based on multispectral image technology
K. Yang, Zhejiang University, China; with L. Feng and Y. He

9:30 AM
Development of an intelligent watchdog model for quality control of an affective bio-greening material
M. Ushada, Osaka Prefecture University, Japan; with H. Murase

9:45 AM
Grass yield estimation using a 3-dimensional laser scanner
Y. Kaizu, Hokkaido University, Japan; with N. Noguchi

10:00 AM
Coffee Break

10:30 AM
Panel Discussion: Future of Bio-Production Automation Research (Chancellor Ballroom)
Chairperson: Dr. K. C. Ting, University of Illinois at Urbana-Champaign, USA
Panelists:
Dr. T. Burks, University of Florida, USA
Dr. J. De Baerdemaeker, Katholieke Universiteit Leuven, Belgium
Dr. N. Kondo, Kyoto University, Japan
Dr. Jim Lenz, Deere & Company, USA
Dr. Minzan Li, China Agricultural University, China
Dr. E. J. van Henten, Wagenigen University, The Netherlands

12:00 PM
Lunch (Chancellor Ballroom)

2:00 PM
IFAC Committee Meeting (Chancellor Ballroom)

5:00 PM
Cookout Gathering (Heritage Room, ACES Library)
**International Program Committee**

Chair: Q. Zhang (Washington State University, USA)
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