2010 Sino-U.S. International Workshop on Intelligent Equipment for Precision Agriculture and Airborne Remote Sensing and Measurement for Agriculture

College Station, Texas, USA

December 2-5, 2010

Workshop Chairperson

Dr. Yubin Lan, USDA-ARS-SPARC-APMRU, College Station, TX 77845

Organizing Committee

Dr. Wang Yingkuan, Chinese Society of Agricultural Engineering, International Journal of Agricultural and Biological Engineering (IJABE)

Dr. Paul Chen, University of Minnesota/ABE Publishing & Communications, LLC

Conference Coordination

Beijing Xinde Chuangye Culture Communication Co, Ltd

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Welcome Message

Dear International Precision Agriculture and Remote Sensing Community:

It is a pleasure to announce the 2010 Sino-U.S. International Workshop on Intelligent Equipment for Precision Agriculture and Airborne Remote Sensing and Measurement for Agriculture to be held at the USDA-ARS Southern Plains Agricultural Research Center (SPARC), College Station, Texas, USA from December 1-8, 2010.

We welcome you to this Sino-US Workshop at College Station, where the USDA-ARS SPARC and Texas A&M University are located. Texas A&M University is the seventh-largest university with one of the largest main campuses in the U.S., and is also the site of the George Bush Presidential Library.

Traditional agriculture is advancing to modern and intelligent agriculture with the development of science and technology and social progress. Information technology plays a key role in this conversion, dealing with less controllability and stability because of regionality, seasonality and

variability. Precision agriculture as a trend featured with digital, visual, networked and intelligent agriculture is growing, as is the precision agricultural community across the world.

The 2010 Sino-U.S. International Workshop on Intelligent Equipment for Precision Agriculture and Airborne Remote Sensing and Measurement for Agriculture is envisaged to be a scholarly and professional symposium, with about 60 attendees from China and the U.S. Over a dozen experts and professors will be invited to present as key speakers. This workshop will provide a forum for presentations on the current state of intelligent equipment for precision agriculture research and applications, application of remote sensing and information technologies in agriculture. The conference will facilitate interactions among research scientists, producers, technology company representatives, equipment manufacturers, input dealers, agronomic consultants, software developers, educators, and government personnel.

During the workshop, an evening session will be held to seek for the possibility of building bilateral ties for future exchange and cooperation between Chinese and U.S. scientists and institutions.

We are looking forward to seeing you at the Sino-U.S. workshop on Intelligent Equipment for Precision Agriculture and Remote Sensing and Measurement Technology in College Station, Texas, USA.

Sincerely yours,

Dr. Yubin Lan, Agricultural Engineer, USDA-ARS-SPARC-APMRU

Chair of the 2010 Sino-US International Workshop on Intelligent Equipment for Precision Agriculture and Airborne Remote Sensing and Measurement for Agriculture

Call for Abstracts and Papers

Abstracts for the 2010 Sino-US International Workshop on Intelligent Equipment for Precision Agriculture and Airborne Remote Sensing and Measurement for Agriculture may be submitted online to the email at ijabecohost@gmail.com before the abstract submission deadline, September 28, 2010, and full papers before November 20, 2010. Abstracts are limited to no more than 500 words. Abstracts will be reviewed for suitability based on scientific content, writing and

clarity. Abstracts meeting these criteria will be accepted for presentation as either oral or poster presentations at the Workshop.

Authors of accepted abstracts will be entitled to present their research at the Workshop after payment of registration fees. They will also be entitled to submit full papers (more details later) to the IJABE (http://www.ijabe.org) in December, 2010. Full papers submitted to this Workshop will be published in IJABE if meeting the criteria of IJABE through peer review.

Main Topics

Intelligent Equipments for Precision Agriculture

Airborne Remote Sensing (manned and unmanned)

Ground-based Remote Sensing

VRT (variable rate technology) and Variable-rate application

Aerial application technology for crop production and protection

Spraying droplet measurements and DRT (drift reduction techniques)

Electronic nose and VOC (volatile organic compound) analyzer

Modeling, Geo-statistics, Geodata and software

Sensor Application in Managing In-season Crop Variability

Spatial Variability in Crop, Soil and Natural Resources

Remote Sensing Applications in Precision Agriculture

Engineering Technologies and Advances

Emerging Issues in Precision Agriculture (Energy, Biofuels, Climate Change)

Guidance, Auto Steer, and GPS Systems

Global Proliferation of Precision Agriculture and its Applications

Principal Contact

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Invited Speakers

Brad Fritz, PhD, Agricultural Engineer, USDA-ARS-SPARC-APMRU

Yufeng Ge, PhD., Texas A&M University

W. Clint Hoffmann, PhD, Agricultural Engineer, USDA-ARS-SPARC-APMRU

Yanbo Huang, PhD, Agricultural Engineer, USDA-ARS, Stoneville, Mississippi

Ron Lacey, PhD, Professor, Texas A&M University

Yubin Lan, PhD, Agricultural Engineer, USDA-ARS-SPARC-APMRU

Dan Martin, PhD, Agricultural Engineer, USDA-ARS-SPARC-APMRU

Sorin Popescu, PhD, Professor, Texas A&M University

Eric Risch, Ph.D., Professor, Prairie View A&M University

Zhuping Sheng, Ph.D., Associate Professor, Texas A&M University

Ruixiu Sui, PhD, Agricultural Engineer, USDA-ARS, Stoneville, Mississippi

Alex Thomasson, PhD, Professor, Texas A&M University

Steve Thomson, PhD, Agricultural Engineer, USDA-ARS, Stoneville, Mississippi

Ning Wang, Ph.D., Associate Professor, Oklahoma State University

Chenghai Yang, PhD, Agricultural Engineer, USDA-ARS, Weslaco, Texas

Fedro S Zazueta Ranahan, Ph.D., Professor and CIGR president, University of Florida

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Workshop Agenda

Thursday: 2 December 2010

Registration and Social

Friday: 3 December 2010 Ballroom 5 & 6, Hilton Hotel

8:00 – 8:20 a.m. Welcome and Workshop Overview

Dr. Yubin Lan, Agricultural Engineer, USDA-ARS-SPARC-APMRU
Dr. Clint Hoffmann, Agricultural Engineer, USDA-ARS-SPARC-APMRU
Dr. Wang Yingkuan, Editor-in-chief, Chinese Academy of Agric Eng

Session Chairs: Dr. Ron Lacey, Professor, Texas A&M University

Dr. Huang Wenjiang, Research Professor

Beijing Research Center for Information Technology in Agriculture

8:21 – 8:40 a.m. **Fedro S. Zazueta**, University of Florida

Technology in agriculture: A long term view

8:41 – 9:00 a.m. **Steve J. Thomson**, USDA-ARS, Stoneville, Mississippi

Flow control and variable-rate aerial application

9:01 – 9:20 a.m. **Sorin C. Popescu,** Texas A&M University

Different perspectives on the forests: Lidar remote sensing from the ground, air, and space

9:21 – 9:40 a.m. **Eric Risch,** Prairie View A&M University

Precision agriculture: Advance in GPS/GIS as applied in agriculture

9:41 - 10:00 a.m. **Ruixiu Sui,** USDA-ARS, Stoneville, Mississippi

Ground-based sensing system for precision agriculture

10:01—10:20 am Twenty Minutes Break

Session Chairs: Dr. Steve Thomson, Agricultural Engineer, USDA-ARS, Stoneville, MS
Dr. Zhu Yan, Professor, Nanjing Agricultural University

10:21- 10:40 a.m. **J. Alex Thomasson**, Texas A&M University

Modeling spatial data for precision agriculture & remote sensing: Part I

10:41- 11:00 a.m. **W. Clint Hoffmann**, USDA-ARS-SPARC-APMRU

USDA aerial application research in college station, TX

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11:01- 11:20 a.m. **Brad Fritz**, USDA-ARS-SPARC-APMRU

Atomization and transport of aerially applied sprays

11:21- 11:40 a.m. **Dan Martin**, USDA-ARS-SPARC-APMRU

Considerations for variable-rate aerial application

11:41- 12:00 a.m. **Yubin Lan**, USDA-ARS-SPARC-APMRU

Development of airborne and ground based remote sensing systems for precision aerial applications

12:00 – 1:30 pm Lunch, Hilton Hotel Restaurant

1:30 – 4:30 pm Site visit to USDA Labs, Riverside campus

Chair: W. Clint Hoffmann, PhD, Agricultural Engineer, USDA-ARS-SPARC-APMRU

See the agricultural airplanes, VRT systems, airborne remote sensing system, wind tunnels and droplet size measurement systems.

5:00 – 8:00 pm Welcome party and dinner at Yubin Lan's House

8:00 – 9:00 pm Night Visit to College Station Christmas Lights at Central Park

Saturday: 4 December 2010 Brazos Room, Hilton Hotel

Session Chairs: Dr Zhuping Sheng, Associate Professor, Texas A&M University

Dr. Zhang Xiaochao, Research Professor, Chinese Academy of Agricultural Mechanization Sciences

8:00 – 8:20 a.m. **Yufeng Ge**, Texas A&M University

Modeling Spatial Data for Precision Agriculture & Remote Sensing: Part II

8:21 – 8:40 a.m. **Chenghai Yang**, USDA-ARS, Weslaco, Texas

Airborne multispectral and hyperspectral imaging systems for precision agriculture

8:41 – 9:00 a.m. **Yanbo Huang**, USDA-ARS, Stoneville, Mississippi

Airborne remote sensing for precision aerial application of crop production and protection materials

9:01 – 9:20 a.m. **Ning Wang**, Oklahoma State University

Wireless sensor network technology for rapid evaluation of spatial soil property distribution

9:21 – 9:40 a.m. **Shufeng Han**-John Deere, **Yubin Lan**- USDA-ARS

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Challenges and opportunities in automation of agricultural machinery

9:41—9:50 am Ten Minutes Break

Session Chairs: Dr. Ning Wang, Associate Professor, Oklahoma State University

Dr. Zhang Wei, Professor, Heilongjiang Bayi Agricultural University

9:51- 10:10 a.m. **Zhuping Sheng**, Texas A&M University

Precision irrigation: Estimating ET over Pecan Orchards through moisturing, Eddy covariance and remote sensing

10:11- 10:30 a.m. **Huihui Zhang**, Texas A&M University

Multisensor data fusion in the detection of nitrogen status on crop Canopy

10:31- 10:50 a.m. **Ningye Ding**, **Yubin Lan,** USDA-ARS-SPARC-APMRU

Rapid identification using an electronic nose

10:51- 11:10 a.m. **Wang Yingkuan**, Chinese Academy of Agricultural Engineering

Introduction to International Journals in ABE: CIGR Journal, IAEJ and IJABE

11:11- 11:40 a.m. **Max Huff, John Pointon, Yang Han**, OminStar

Omni Star-Satellite positioning

11:41- 12:00 a.m. Discussion, Q&A

12:00 – 1:00 pm Lunch at Hilton Hotel Restaurant

1:00 – 5:30 pm Visit George Bush Library and Texas A&M University Campus

6:00 – 8:30 pm Closing Banquet at Hilton Hotel Oakwood Ballroom

Sunday: 5 December 2010

Check out and early breakfast

Head to Houston

Then head to George Bush Airport to travel to Savannah, GA to attend the NAAA (National Agricultural Aviation Association, Dec. 6th to 9th).

Aerial Application Technology

USDA ARS

Welcome to the International Workshop on Intelligent Equipment for Precision Agriculture and Airborne Remote Sensing and Measurement for Agriculture

Hosted by

USDA-ARS

Aerial Application Technology Group

Areawide Pest Management Research Unit

College Station, TX

DIRECT – SEEDING OF RICE IN AUSTRALIA

Graeme D Batten

Sea Spec Pty Ltd, PO Box 487,

Woolgoolga NSW 2456 AUSTRALIA

Precision Agriculture in Rice Production – An Overview

Naiqian Zhang
U.S. Fulbright Scholar
Visiting Professor, University of Philippines, Los Baños
Professor, Kansas State University

Marvin C. Petingco
Instructor III
University of Philippines, Los Baños

November 16, 2010

Modeling Spatial Data for Precision Agriculture & Remote Sensing: Part I

J. Alex Thomasson and Yufeng Ge
Bio. & Ag. Engineering, Texas A&M University

Ruixiu Sui
USDA-ARS

International workshop on intelligent equipment for precision agriculture and airborne remote sensing and measurement for agriculture
December 2-5 2010 USDA-ARS

Aerial Application Technology

USDA ARS

Atomization and Transport of Aerially Applied Sprays

Brad Fritz
USDA ARS Aerial Application Technology
College Station, TX 77845

西北农林科技大学
Northwest A&F University

设施农业智能装备的研究
——基于远程监控与视觉导航技术的研究

杨福增 教授
机械与电子工程学院

USDA Aerial Application Research in College Station, TX

Aerial Application Technology Group
USDA-Agricultural Research Service
College Station, Texas, USA

Multisensor data fusion in the detection of nitrogen status on crop canopy

Huihui Zhang[1], Yubin Lan[2], Ronald Lacey[1], W. Clint Hoffmann[2]
[1] BAEN, Texas A&M University
[2] USDA-ARS, College Station, TX

Rapid Identification Using an Electronic Nose

Ningye Ding, Ph. D. candidate
Northeast Agricultural University

Yubin Lan, Ph.D., Agricultural Engineer
USDA-ARS, College Station, TX

Xianzhe Zheng, Ph.D., Professor
Northeast Agricultural University

Ground-Based Sensing System for Precision Agriculture

Ruixiu Sui（隋瑞秀）
Agricultural Engineer
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Alex Thomasson
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Texas A&M University
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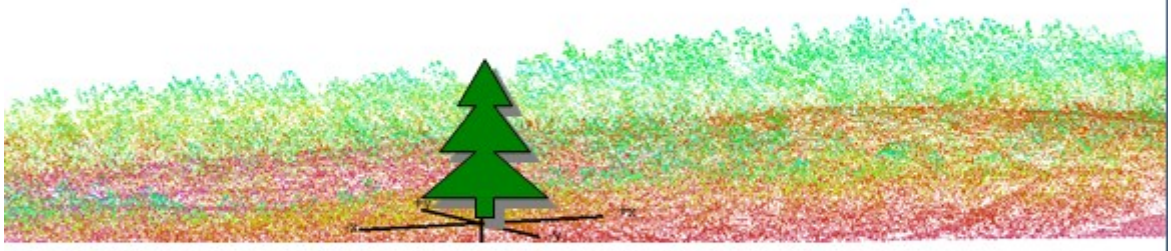
Challenges and Opportunities in Automation of Agricultural Machinery

Dr. Shufeng Han-John Deer
Dr. Yubin Lan-USDA ARS

Different perspectives on the forests: lidar remote sensing from the ground, air, and space



Sorin C. Popescu

Associate Professor
Department of Ecosystem Science and Management
Texas A&M University

Flow Control and Variable-Rate Aerial Application

Dr. Steven J. Thomson

Lead Scientist and Research Agricultural Engineer
USDA-ARS-CPSRU
Stoneville, MS USA

Adjunct Professor
Bio and Ag. Engineering
Mississippi State University
Starkville, MS USA

Airborne Remote Sensing for Precision Aerial Application of Crop Production and Protection Materials

Yanbo Huang

USDA-ARS Crop Production Systems Research Unit

Mississippi State University

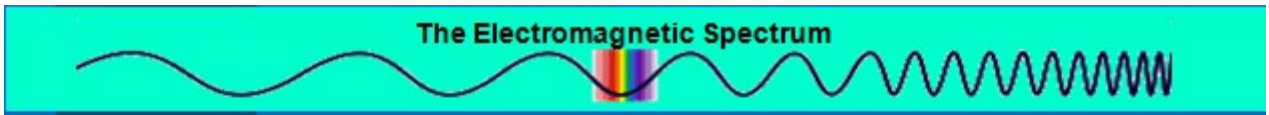
Texas A&M University

Development of Airborne and Ground-based Remote Sensing Systems for Precision Aerial Applications

Yubin Lan

USDA-ARS

College Station, Texas, USA



Airborne Multispectral and Hyperspectral Imaging Systems for Precision Agriculture

Chenghai Yang

Agricultural Engineer

USDA-ARS

Weslaco, Texas

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Wireless Sensor Network Technology for Rapid Evaluation of Spatial Soil Property Distribution

农田土壤含水量空间分布信息快速获取无线传感器网络技术研究

Ning Wang, Zhen Li, Aaron Franzen, Peyman Taher
Oklahoma State University
Oklahoma, USA