

PMA06 Conference Program

The Second International Symposium on Plant Growth Modeling,

Simulation, Visualization and Applications

Beijing (CHINA PR), November 13-17, 2006



INTRODUCTION

The PMA symposium series has been initiated by LIAMA, the French-Chinese Laboratory for Computer Sciences, Automation and Applied Mathematics. PMA06 has been organized in partnership with IEEE, and is supported by several Chinese and French Institutes (CAF, CAS, CASIA, CAU, CSIG, NERCITA, CIRAD, INRA, INRIA), as well as by the French Embassy in China and the National Natural Science Foundation of China (NSFC). PMA06 is also supported by scientific journals, i.e. Annals of Botany, Journal of Computer Science and Technology and the International Journal of Virtual Reality, which will publish selected papers in special issues.

This highly multi-disciplinary conference hosts over 100 participants from 15 different countries. The main goal of this event is to bring together researchers working on plant growth modeling and applications, but from different backgrounds, i.e. plant sciences, forestry, agronomy, environmental sciences, mathematics and computer sciences.

The PMA06 conference takes place in Beijing, China, at the Beijing Friendship Hotel (see map on page 4). Beijing is the center for culture, science, communication, and many other aspects of Chinese life.

The capital of China is now a modern metropolitan city with a rich cultural heritage, from royal palaces and traditional monuments, of which the most famous are the Forbidden City and the Great Wall, to the popular Hutongs and Beijing Opera. Beijing is also a model of Chinese people's life and is the gateway to other parts of China.

Agriculture-, Forestry- and Environmental- Sciences are very important issues in China. More than 30 universities in the Mainland of China are dedicated to Agriculture or Forestry, some of which are situated in the Beijing area. In this setting, development and application of Plant Growth Models and Visualization tools have become increasingly important. PMA06 also provides opportunities for the increasing number of Chinese researchers active in these fields, to enter the international community.

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MAP OF THE FRIENDSHIP HOTEL



PMA06 TIME TABLE

<i>SUNDAY – November 12</i>	
BEIJING FRIENDSHIP HOTEL – BUILDING 1	
16:00-18:40	Registration
<i>End of the registration day</i>	

MONDAY – November 13	
BEIJING FRIENDSHIP HOTEL – BUILDING 1 – FUNCTION ROOM	
08:15-08:45	Registration
08:45-09:15	Welcome ceremony
09:15-09:30	Photo session
Special keynote session	
Chairmen – Dr Thierry Fourcaud & Dr Xiaopeng Zhang	
09:30-10:10	<u>Invited keynote:</u> Prof. Hans Lambers (Australia) <i>“Plant Growth Modeling, Simulation, Visualization and Applications”</i>
10:10-10:30	<i>Coffee break</i>
10:30-11:10	<u>Invited keynote:</u> Prof. Baoquan Chen (USA) <i>“Knowledge-Based Geometry Modeling of Laser-Scanned Trees”</i>
Session 1 – Plant Growth and Plant Development Models	
Chairman – Dr Philippe de Reffye	
11:10-11:50	<u>Invited keynote:</u> Dr Jan Vos (Netherlands) <i>“Concepts to model growth and development of plants”</i>
11:50-12:15	Dr Ep Heuvelink (Netherlands) <i>“Fruit set in sweet pepper: a modeling exercise”</i>
12:15-12:40	Dr Loic Pages (France) <i>“MiniRoot: a simple architectural model of the root system connected to the shoot system”</i>
12:40-14:00	<i>Lunch</i>
BEIJING FRIENDSHIP HOTEL – BUILDING 8 – ROOM 1	
Chairman – Dr Gerhard Buck-Sorlin	
14:00-14:25	Dr Jean Dauzat (France) <i>“Simulation of ecophysiological processes on 3D virtual stands with the ARCHIMED simulation platform”</i>
14:25-14:50	Dr Zhigang Zhan (China) <i>“On functional leaves behaviour in Gossypium growth with respect to defoliation experimentations”</i>
14:50-15:15	Dr Christophe Angelique (France) <i>“Analysis of Arabidopsis growth and development based on the dynamic model GreenLab”</i>

MONDAY – November 13	
15:15-15:35	Poster presentation (4mn/poster) Dr Eunmi Lim (Japan) <i>“Application of Virtual Reality and Plant Modeling for Participation in Urban Planning and Design”</i> Dr Mezghani M. Aiachi (Tunisia) <i>“Modelling vegetative growth of olive tree (Olea europaea L.)”</i> Dr Herve Rey (France) <i>“Sunflower (Helianthus annuus sp.) growth analysis by source – sink relationships study with GreenLab model”</i> Dr Gaetan Louarn (France) <i>“Modelling grapevine (Vitis vinifera L.) canopy structure with the reconstruction model TOPVINE : Comparison of various training systems through accurate computation of exposed leaf area and light microclimate in the fruiting zone”</i> Prof Weixing Cao (China) <i>“Modeling Leaf Morphological Growth in Winter Wheat”</i>
15:35-15:55	Poster Session - Coffee break
Chairman – Dr Loic Pages	
15:55-16:20	Dr Somporn Chuai-Aree (Germany) <i>“An Algorithm for Simulation of Leaf Vein, Shoot and Root Growth Based on Their Environmental Factors”</i>
16:20-16:45	Dr Lionel Dupuy (UK) <i>“Multicellular computation of plant morphogenesis”</i>
16:45-17:55	Poster presentation (4mn/poster) Dr Mengzhen Kang (China) <i>“Plant Distribution from the Greenlab Stochastic Organogenesis Model”</i> Dr Ping Zheng (China) <i>“Study on Modeling of Soybean Structure”</i> Dr Jean-Francois Ledent (Belgium) <i>“A 3D model to visualize maize canopies from simple measurements”</i> Dr Dingchun Yan (China) <i>“Implementation of 3D Visualization System for Maize Growth”</i> Mr Qingqiong Deng (China) <i>“Continuous LOD model of coniferous foliage”</i>
17:55-17:30	Poster Session
17:30-18:30	Ice breaker party
End of Day 1	

TUESDAY – November 14	
BEIJING FRIENDSHIP HOTEL – BUILDING 8 – ROOM 1	
Session 2 – Theoretical Advances in Plant Growth Modeling	
Chairman - Prof Abdullah A. Jaradat	
09:00-09:40	<p>Invited keynote: Dr Paul-Henry Cournede (France) <i>“A functional and architectural model of competition for plant growth”</i></p>
09:40-10:05	<p>Dr Gerhard Buck-Sorlin (Germany) <i>“Towards "Virtual Barley": Relational Growth Grammars as a universal framework for rule-based hierarchical modelling of morphogenesis, plant function, regulatory networks, and genetic processes”</i></p>
10:05-10:30	<p>Ms Amelie Mathieu (France) <i>“Generation of rhythms in plant development controlled by their functioning: theoretical and numerical study”</i></p>
10:30-10:50	<p>Poster presentation (4mn/poster) Dr Ming Sun (China) <i>“Existing state and application on nondestructive measurement of plant growth based on machine vision”</i> Prof Guifen Chen (China) <i>“Digital image technology in the diagnosis of pests and related algorithms”</i> Dr Pierre Lejeune (Belgium) <i>“Traitmilltm: A Genomics Platform For Modeling Gene Function In Plant Development”</i> Dr Qiaoxue Dong (China) <i>“Modeling the phenotypic plasticity of the tomato crop (<i>Lycopersicon esculentum</i> Mill.) in response to light and planting density using the structural-functional model GREENLAB”</i> Prof Weixing Cao (China) <i>“A quantitative analysis on leaf curvature characteristics in rice”</i></p>
10:50-11:10	Poster Session - <i>Coffee break</i>
Chairman – Prof Baogang Hu	
11:10-11:35	<p>Prof Abdullah A. Jaradat (USA) <i>“Phenotypic plasticity and fractal dimension are strong determinants of grain yield in soybean”</i></p>
11:35-12:00	<p>Ms Veronique Letort (France) <i>“Quantitative Genetics and Plant Growth Simulation: a Theoretical Study of Linking Quantitative Trait Loci (QTL) to Model Parameters”</i></p>

TUESDAY – November 14	
12:00-12:20	<p>Poster presentation (4mn/poster) Dr Youhong Song (Australia) <i>“Characterizing and modelling rice vegetative morphogenesis: case of one morphogenetic deficient mutant and its wild type Nippon Bare”</i> Dr Laurent Saint-Andre (France) <i>“Integrating Nutrient Cycling into a Growth and Yield Model calibrated for Eucalypt Plantations in Congo”</i> Dr Xiangdong Lei (China) <i>“A matrix growth model of natural Spruce-balsam fir forest in New Brunswick, Canada”</i> Prof Mingquan Zhou (China) <i>“Simulation of Trees by IFS and 3D Reconstruction in Virtual Environment”</i> Dr Huaiqing Zhang (China) <i>“Applications of virtual reality technology in forestry”</i></p>
12:20-14:00	<i>Lunch</i>
Session 3 – Modeling Plant Interaction with its Environment	
Chairman – Dr Ep Heuvelink	
14:00-14:25	Dr Xavier Draye (Belgium) <i>“Soil-plant-atmosphere modelling in a multi-scale and multi-model simulation platform”</i>
14:25-14:50	Dr Cailian Lao (China) <i>“Modeling Light Distribution within Plant Canopy Based on BSDFs of Single Leaves”</i>
14:50-15:15	Dr Sebastien Gayler (Germany) <i>“Modelling plant-plant and plant-pathogen interactions with the plant growth model PLATHO”</i>
15:15-15:35	<i>Coffee break</i>
Chairman – Dr Alexia Stokes	
15:35-16:00	Prof Baogui Zhang (China) <i>“Impact of P deficiency on biomass partitioning and root system architecture”</i>
16:00-16:25	Dr Thierry Fourcaud (France) <i>“A hypothesis on the biomechanical adaptation of root structure based on numerical analyses of root-soil mechanical interaction”</i>

TUESDAY – November 14	
16:25-16:50	<p style="text-align: center;">Poster presentation (4mn/poster) Dr Zhangang Wang (China) <i>“3D Forestation Simulation Based on Direct 3D-Interaction”</i> Dr Lu Ke (China) <i>“Research of Dynamic Monitoring of Land Using Based on Remote Sensing and GIS”</i> Dr Ping Zheng (China) <i>“Study on Methods of Digital Design of Crop Structure”</i> Prof Weixing Cao (China) <i>“Development of Growth Model-based Decision Support System for Crop Management”</i></p> <p style="text-align: center;">Software presentation (4mn/poster) Prof Chaoxing He (China) <i>“Software development on Intelligent Expert Decision System for Tomato Production Management in Solar Greenhouse”</i> Dr Somporn Chuai-Aree (Germany) <i>“PlantVR: Software for Simulation and Visualization of Plant Growth Model”</i> Dr Xiaopeng Zhang (China) <i>“Image based real-time and realistic forest rendering”</i></p>
16:55-18:00	Software Demonstration and Poster session
19:00-22:00	CONFERENCE DINNER
End of Day 2	

WEDNESDAY – November 15	
BEIJING FRIENDSHIP HOTEL – BUILDING 8 – ROOM 1	
Session 4 – Application of Plant Growth Models in Agronomy	
Chairman – Dr Jean-Francois Ledent	
09:00-09:40	<u>Invited keynote:</u> Prof. Yan Guo (China) “Application of plant models to Agronomy”
09:40-10:05	Prof Haishun Yang (USA) <i>“Hybrid-Maize: A simulation model that meets the demands of diverse users and their applications”</i>
10:05-10:30	Dr Yuntao Ma (China) <i>“Evaluation of functional-structural model GREENLAB-Maize with sparse experimental data”</i>
10:30-10:50	Poster presentation (4mn/poster) Dr Zhongfu Sun (China) <i>“A Web-based Simulation System for Greenhouse Crops”</i> Dr Jan Haberle (Czech Republic) <i>“Simulation of the effect of the amount and distribution of soil mineral nitrogen on wheat yield and grain N concentration”</i> Dr Mohammad E. Asadi (Iran) <i>“Determination of Crop Water Use and Crop Coefficient of Corn Silage Based on Crop Growth Stages”</i> Dr Guifen Chen (China) <i>“The Development of Dynamic Information Management System for Maize Based on GPS, GIS”</i> Dr Wenjiang Huang (China) <i>“Assimilation of crop architecture models and canopy spectrum data in winter wheat”</i>
10:50-11:10	Poster Session - <i>Coffee break</i>
Chairman – Prof Baoguo Li	
11:10-11:35	Dr Mengzhen Kang (China) <i>“Fitting weight of individual organs in spring wheat using the GreenLab model”</i>
11:35-12:00	Dr Ashok Shahi (India) <i>“Phenological approaches to support adaptation and modeling for prediction of essential oil production and quality as total Geraniol content of Cymbopogon commutatus (Steud.) Stapf”</i>
12:00-12:25	Dr Kefa Zhou (China) <i>“Study on Application of Cotton2k Model in Cotton Growing in Xinjiang, China”</i>
12:25-13:30	<i>Lunch</i>
13:30-19:00	<i>VISIT OF THE GREAT WALL</i>
End of Day 3	

THURSDAY – November 16	
BEIJING FRIENDSHIP HOTEL – BUILDING 8 – ROOM 1	
Session 5 - Application of Tree Growth Models in Forestry	
Chairman – Prof Yuanchang Lu	
09:00-09:40	<u>Invited keynote:</u> Prof. Hans Pretzsch (Germany) “Models for Forest Ecosystem Management, a European Perspective”
09:40-10:05	Dr Kiysohi Umeki (Japan) <i>“Determinants of diameter growth of current-year and one-year-old shoots in Betula platyphylla in Hokkaido, northern Japan”</i>
10:05-10:30	Dr Akihiro Sumida (Japan) <i>“Stable foliage cluster (FC), a basic unit of the crown structure of tree species and its application to modeling of tree and forest structure”</i>
10:30-10:50	Poster presentation (4mn/poster) Dr Christian Higuera (Chile) <i>“Methodology to evaluate productivity and profitability in plantations of Pinus radiata D.DON in Chile”</i> Dr Pedro Real (Chile) <i>“National Growth and Yield Simulation Project: example of cooperation among private sector and research institutes”</i> Dr Qing Zhang (China) <i>“Study on RS- and GIS-based Ecological Capital Assessment in Arid Areas”</i> Dr Veronique Cucchi (France) <i>“Development of a spatial decision support tool for the management of eucalypt plantations in Congo”</i> Ms Lingxia Hong (China) <i>“Integrated Stand Growth Model (ISGM) and Its Application”</i>
10:50-11:10	Poster Session - <i>Coffee break</i>
Chairman – Dr Kiysohi Umeki	
11:10-11:35	Dr Pedro Real (Chile) <i>“INSIGNE the new growth and yield simulator for Pinus radiata D.DON in Chile”</i>
11:35-12:00	Dr Christian Higuera (Chile) <i>“Development of a National Data Bank System as tool to administrate the Data for growth and Yield models of Pinus radiata (D.Don) and Eucaliptus spp. in Chile”</i>
12:00-12:25	Mr Francois de Coligny (France) <i>“Efficient building of forestry modelling software with the Capsis methodology”</i>
12:25-14:00	<i>Lunch</i>
Session 6 – Analyzing and Modeling Plant Structure	
Chairman – Dr Akihiro Sumida	
14:00-14:25	Mr Zhanglin Cheng (China) <i>“Tree Skeleton Extraction from a Single Range Image”</i>
14:25-14:50	Dr Zhongke Wu (China) <i>“Interactive Modeling Trees with Ball B-Splines”</i>

THURSDAY – November 16	
14:50-15:15	Ms Guo Hong (China) “Analysis of assimilate source and sink forces in <i>Pinus tabulaeformis</i> Carr. using the functional-structural model Greenlab”
15:15-15:35	Poster presentation (4mn/poster) Prof Baogui Zhang (China) “An auto-regressive integrated moving average model for characterising winter wheat root branching” Dr Frederic Danjon (France) “Analysis of 3D structural root architecture data of trees grown on slopes” Dr Xia Ning (China) “A Study on Branching Structures of One Year Old Branch of apple tree by Pruning Using Hidden Semi-Markov Chain” Dr Catherine Chenu (France) “Towards an architectural approach to drive maize breeding for cold tolerance” Dr Anna Vehanen (Finland) “Effect of inter- and intraspecific competition on the crown structure of Silver birch”
15:35-15:55	Poster Session - Coffee break
Chairman – Dr Daniel Barthelemy	
15:55-16:20	Dr Pierre Martin (France) “Architectural and geometrical representations of cotton plants for simulating their light interception at low density”
16:20-16:45	Dr Gregoire Vincent (France) “Exploring cost and benefit of tree crown plasticity using a 3D dynamic stand growth simulator”
16:45-17:10	Mr Jean-Francois Barczi (France) “AMAPsim: an interactive plant architecture simulator based on botanical concepts”
17:10-17:30	Poster Session
End of Day 4	

FRIDAY – November 17	
BEIJING FRIENDSHIP HOTEL – BUILDING 8 – ROOM 1	
Session 7 – Plant and Landscape Geometrical Models and Visualization Techniques	
Chairman – Dr Philippe Decaudin	
09:00-09:40	Invited keynote: Prof. Enhua Wu (Macao) <i>“Realistic Rendering of Landscapes directed to Real Time Requirement in Virtual Reality”</i>
09:40-10:05	Dr Marc Jaeger (France) <i>“Simulation and Visualization of Functional Landscapes : Effects of the Competition between Plants”</i>
10:05-10:30	Mr Teng Jun (China) <i>“Fast Ambient Occlusion Algorithm for Real-Time Plant Rendering”</i>
10:30-10:55	Ms Qingqiong Deng (China) <i>“Fast and Progressive Simplification of Complex Foliage”</i>
10:55-11:15	<i>Coffee break</i>
Chairman – Dr Marc Jaeger	
11:15-11:40	Mr Weiming Dong (France) <i>“Realistic Simulation of Seasonal Variant Maples”</i>
11:40-12:05	Prof Zhigen Pan (China) <i>“Plant Reconstruction from image streams based on weak structured lights”</i>
12:05-12:30	Dr Xinyu Guo (China) <i>“Geometric Modeling and Visualization of Corn Based on Morphological Characteristic Parameters”</i>
12:30-12:35	Closing remarks
12:35-14:00	<i>Lunch</i>
End of the Conference	

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