

Marc JAEGER

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French citizen. Born September 7th, 1962.



Current position

Deputy Director, CIRAD AMAP Unit, Senior Researcher <https://amap.cirad.fr>

Digital Plants research line coordinator (2020-2023) <https://amap.cirad.fr/en/axe3.php>



Fields of expertise

Functional structural plant growth models
Computer graphics (Natural Phenomena), and Image processing
Scientific animation in Applied mathematics and Computer sciences
Interaction and projects with industry

Applications (Methodologies, Software developments, projects, PhD supervision)

Functional Structural plant growth model and their applications
Simulated Plants, Stand, crops, landscape simulation and visualization
Applications mobilizing image processing and image synthesis for agroecology



Education

- Dec. 2010: Habilitation à diriger des Recherches (Computer Sciences). University Blaise Pascal, Clermont-Ferrand II.
- Dec. 1987: PhD thesis in Computer Science, University of Strasbourg.
- Sep. 1985: D.E.A. (master degree) in Computer Science, University of Strasbourg.
- June 1984: Master in Computer Sciences applied to Management (MIAGE), Uni. of Mulhouse.
- June 1980: Baccalauréat C (Mathematics), Lycée Bartholdi, Colmar.

Past positions

- Nov. 2006 - Nov. 2008: Engineer Specialist at INRIA Saclay, EPI DigiPlante Team (INRIA / Ecole Centrale Paris CIRAD).
- July 2006 - Oct. 2006: Senior Researcher at CIRAD-AMAP (UMR BBAP, Cirad/Inra/Cnrs/Montpellier Univ. II/ IRD)
- Jan. 2002 - Jan. 2006: French Director of LIAMA (Beijing - PR CHINA).
- Jan. 2002 - June 2006: Guest Professor of Chinese Academy of Sciences. Beijing Information Sciences and Technology Graduate School (Master level).
- Aug. 2001 - July 2006: Senior Researcher in LIAMA (Beijing - PR CHINA).
- June 1999 - July 2001: Scientific Direction of CIRAD. Research co-ordinator in charge of Applied Mathematics and Computer sciences.
- Jan. 1991 - June 1999: CIRAD/AMAP: Head of MEB-C2000 Team (Volume imaging: with medical, forestry, agro-production applications).
- Jan. 1989 - Dec 1990: Research Engineer at CIRAD-AMAP. Plants simulation and landscape design and visualization.
- Jan. 1988 - Dec 1988: National service. EELAT helicopter school. Analysis/Development of E-learning and 3D simulators systems.
- Feb. 1984 - Dec 1987: Research fellowship at CIRAD (plant growth simulation and visualisation, Master/PhD).
- Jan. 1983 - Sep. 1983: IS in Management: Analyse, conception and development Beghin Say SA. (extended MST Master internship)

Scientific production at a glance

Peer reviewed articles : 43

Books and book chapters : 19

International conferences proceedings : 87

Google Scholar stats (2024/01/08) 2398 citations, h-factor: 22

Ph.D. Students supervision

- Housseem Triki, University of Montpellier. Coupling Plant growth models to Bio-aggressor models. Application on Coffee attacks by rust and BTB. 2022-2024
- Laetitia Lemiere, University of Montpellier, Augmented reality, A tool to design agroforestry systems? 2021-2023
- Shared with S. Sabatier: Adji Beda Innocent, Univ. Jean Lorougnon Guédé, Ivory Coast, Genetic resources and plant selection: Trees Architecture and Structure-function Modeling of Plants 2018-2022
- Guilhem Brunel, University of Montpellier 2, Automated Cell file detection in wood cross section images. 2011-2014;
- HongJun LI, Beijing Forestry University and CASIA, 3D tree geometrical reconstructions from terrestrial laser scans. 2008-2012.
- Vincent le Chevalier, Ecole Centrale de Paris, Functional Landscapes (Plant and crops models in interaction with water cycle models). 2006-2010;
- Heaven WU, China Agricultural University (CAU), 3D reconstruction of wheat roots from microscopic slices, 2005-2009.
- QingQiong Deng, CASIA, Virtual plant foliage LOD and multiresolution models, 2004-2008.
- Chao Zhu, CASIA, Defining tree crown geometry from point clouds, 2006-2010;
- Mei Xing, CASIA, Landscape visualization and rendering, 2004-2006;
- Teng Jun, CASIA, GPU based Multilevel Plants and tree visualization, 2002-2007.
- ZhiFeng Cai, CASIA, Image Registration with non-linear elastic models, 2000-2004.
- Stéphane Chemouny, Univ. Montpellier II, 3D non-linear image filtering, 1997-2001.
- Frédéric Banégas, Ecole des Mines de St Etienne, 3D geometric solid characterization, 1997-2000.

Teaching activities

- 2008->2016. Elements of computer graphics, Plant growth modelling, simulation and visualization. Participations to Doctorate schools at Ecole Centrale Paris and LIRMM Montpellier (8 sessions)
- 2002 -> 2006. Computer Graphics and applications in life sciences. Master Course. CAS. IST Graduate School. Beijing. Contents: Elements of computer graphics: 28 hours (12 hours practice); Natural phenomena. 6 hours (3 hours practice); Volume imaging. 6 hours (3 hours practice).
- 2003, 2004. Basic Elements of Computer Graphics. Natural Phenomena, virtual plants and Landscapes. Ecole Centrale de Paris, 6 hours.
- 2001. Symposium Workshop ("Ecole chercheur INRA-CIRAD"). An introduction to Volumic imaging and its applications. June 2001, 25-28th. Montpellier.
- 1997->2001 Computer graphics. Basic elements of C.G. 40 hours course. EMA/ EERIE Institute (Ecole pour les Etudes et la Recherche en Informatique et Electronique de Nîmes, Ecole des Mines d'Alès). CG Modelling, Visualisation, Rendering, Animation.
- 1998, 1999, 2000. Conferences on "Modelling and visualisation of Natural Phenomena" at LIGIM (Laboratoire d'Informatique Graphique et d'Imagerie Numérique de l'Université Claude Bernard à Lyon), LIRMM (Laboratoire d'Informatique de Robotique et de Micro-électronique de Montpellier, Université des Sciences et Techniques du Languedoc).
- 1995,1999. Conferences on Medical Imaging and its applications for Biometry, geometrical modelling, Computer prosthesis design at Faculty of Medecine of Montpellier and Faculty of Dentistry of Toulouse

International events organization

- 2010. Main board and Co-Organizer of LandMod2010, the 2010 International Conference on Integrative Landscape Modelling website. Montpellier SupAgro, February 3-5, 2010
- 2009. Main board and Organizer of PMA09, The 2009' International symposium on plant growth models and their applications. Beijing.
- 2005. Organizer of STIC-ASIA 05 workshop October 24-26th 2005 in Beijing.
- 2003. Main board and Organizer of PMA03, The 2003' International symposium on plant growth models and their applications. Beijing.

Scientific animation

- Since January 2020, animator of Amap's Digital Plant research line
- 2012, Research, collectivities and industry exchanges on virtual reality applications for environment and sustainable planning, 40 participants, Montpellier May 2012
- 2005, GreenLab 2nd Workshop, 55 participants, Beijing June 2005
- 2004. GreenLab First Strategy Workshop, Beijing, 45 participants, October, 2004
- 2003. Main board and Organizer of PMA03, The 2003' International symposium on plant growth models and their applications. Beijing, October 2003.
- 2000-2001: Organizer of several scientific animations on: freeware, plant geometry, image processing, stem modeling, models in decision support tools (agronomy), software engineering.
- Organizer of the Volume Imaging School. June 25-28th, 2001, Montpellier.
- Co-Organizer of the Volume Imaging School. June 25-28th, 2001, Montpellier.

Reviewing, Committees, Event boards, Positions

- Reviewer (2006->2022) for Annals of Botany, Journal of Computer Sciences and Techniques, Journal of Virtual Reality, Transaction on Graphics...
- Reviewer for Eurographics: EG02,EG03,EG05,EG06,EG08 for Siggraph:SIG06,SIG09 for CARI (2000,2004,2008,2010,2014)...
- International scientific boards: PMA2022, PMA2018, VRCAI2016, FSPMA2016, VRCAI2015, VRCAI2013, PMA'12, Regio Resources 2011, Edutainment 2010, LandMod2010, Edutainment 2009, PMA09, Edutainment 2008, PMA06, PMA03
- Participation to LIAMA's Scientific Committee (2000 / 2001, acting F. Houllier, representing CIRAD)
- Expert Member of C2I2MEAD "Environment and sustainable development" certificate definition (MEN-MESR SG/STSI, 2011-2014)
- Board member of the European Land-Use Institute in charge of technology and products (2009_2012)
- Registered at Eu-Cordis expert database (IST priority, and Co-operation with Asia)
- Member of the Sino-French committee for the Sino-French Centre of Sciences and Technology (February-July 2001)
- IADIS (International Association for Development of the Information Society) member 2010-2014
- IEEE member since 2000, Europe Section, France Chapter

Research project co-ordination or major contribution

- France Relance Cirad-Valorhiz Sa. Co-ordinator 2022-2024. Aerial images automated feature identification generation.
- AMPLI ANR Project. 2021-2024. Cordination INSA. Contributions: aerial image classification and procedural plant generation
- DigitVeg Project. Co-ordinator. 2019-2020. Digital vegetation mock-ups. Supported by labex Cemeb and Cirad.
- Labex Agro 1600-027 Project. Co-ordinator. 2017. Architecture et croissance des plantes. Modélisation et applications.(Book and e-book edition)
- UVED GreenLab Project. Co-ordinator. 2013->. Understanding, modeling and simulating plant dynamics. (Numerical teaching resources for)

Research project co-ordination or major contribution (cont.)

- Agropolis Fondation RTRA (Computational Plants and eco-systems) 0902-016 Project. Co-ordinator. 2009->2012. VLS-LRC Virtual Landscapes in Languedoc Roussillon and Catalogna. Thematic regional network dedicated to reunforce collaborative projects on virtual landscapes and eco-systems 3D visualisations
- UVED GreenLab Project. Co-ordinator. 2013->. Understanding, modeling and simulating plant dynamics. (Numerical teaching resources for)
- Agropolis Fondation RTRA (Computational Plants and eco-systems) 0902-012 Project. Co-ordinator. 2009->2011. PMA09 third Interntional Symposium on Plant Growth Modeling, Simulation and Applications.
- Agropolis Fondation RTRA (Computational Plants and eco-systems) 0803-021 Project. 2008->2010. Co-ordinator. Integrative ecosystems & landscape modelling Model level integration for understanding and managing human influenced ecosystems at the landscape scale.
- ANR/Bioenergies/Emerge, 2009->2013. Co-ordinator for Cirad Partner. Task 3. Volume imaging (CT scans) and 3D reconstructions geometry analysis.
- ANR/MMSA/Project Natsim 2006-> 2008. Co-ordinator of work-package 3. Virtual landscape rendering.
- REVPE. Accepted Marie Curie OIF of Philippe Decaudin (INRIA to LIAMA, planned starting spring 2006). First Marie Curie OIF from EU to China.
- LIAMA 2001-08 Project. Advanced medical imaging methods for Hominid Morphology studies. French project co-ordinator. 2002-2003.
- Co-ordinator of the CIRAD Research Initiative Action "Methods and Software Tools for Wood Resource Evaluation". 1999-2000.
- National Project SICRODEF (Ademe funded, 1997-1999). 3D stem geometrical modelling, sawing simulation, adaptive 3D meshes for mechanics.
- EU Fair CT 1915 project STUD (FP4, 1995-1999). Contributor in Work-package 5. Resource evaluation software development and 3D image processing research developments.
- EU Fair PL project OAKKEY (FP4, 1994-1998). Co-ordinator of Work-package 4. 3D simulation and software developments.
- Main contributor in several local projects with Montpellier Hospitals (1993-1998): Embryology, Liver oncology, Wrist and Foot biometry.
- Main contributor in several local projects with University Paul Sabatier of Toulouse and Clinic Pasteur of Toulouse (1994-1998): 3D Cephalometry. Server application is installed in Toulouse (CNUT, 1996) with clients in Faculty of Dentistry and Odontology.

Current running projects

- France Relance Cirad-Valorhiz (Coordinator)
- EU H2020 DigitAF (contributor)
- EU H2020 Eco2Adapt (contributor)
- EU Desira ROBUST (contributor)
- EU Desira Cocoa4Future (contributor)
- ANR AMPLI project (contributor)
- MaCS4Plants Amap-AGAP network (co-animator)
- Sino-French GreenLab project network (PI, co-director).

MOU-Agreements

- 2005. Research co-operation MOU: Ecole Centrale de Paris - LIAMA
- 2005. Research co-operation MOU: INPT-LIAMA
- 2003. Research co-operation - industry agreement: Agreement France Telecom R&D - LIAMA
- 2003-2006: Negotiations, contracts/agreements between LIAMA and local partners: Tsinghua Press, French Embassy, Hotels, Air France

R&D. Transfer to Industry / Research and products for Industry

Transfer to Industry

- 2003-2004. Algorithms and applications (volume image processing and rendering). Supports to Technological transfer to Trigem-Ortho. Start-up in Cap Alpha, Montpellier
- 2003-2004. Algorithms and applications (volume image processing and rendering). Supports to Technological transfer to IntraSense. Start-up in Cap Omega, Montpellier
- 1984-1990. AMAP. Plant generator and Landscape renderer. Basis of the Data structure and algorithms of the current commercial AMAP Range tools (Genesys(TM) and Orchestra(TM)). Technological transfer to Bionatics SA. <http://www.bionatics.com>

R&D projects in relation with industries

- France Relance Cirad-Valorhiz SA (2022-2024) Generating identification features from identification processes in systems aerial images
- Bionatics SA (2012->) Cooperations on Landscape 3D visualization and 3D plant generation
- TALVEG-2 (2016, 2018). Supports in imagery in the frame of revegetalization studies and projects. Valorhiz, Montpellier
- EDF-R&D (2017). Bibliography and opportunity study (imagery)
- EDF-R&D (2016). Preliminary study (imagery)
- TAFER (2013, 2016). Supports in imagery for roadslides and railway banks plant communities 3D visualizations. with the support of SYSTRA (Paris) and Labex Agro, Montpellier
- Lamalou (1997-1998). Design, definition and prototype realisation of a 3D prosthesis design tool. STER Clinic and AFSTR Association, Lamalou les Bains.
- Echo 3D (1996-1998). Research and development. Conception, design, realisation, documentation. 4D Doppler US reconstruction and visualisation software tool to be integrated in a PACS. Medasys Digital Systems, Gif sur Yvette.
- Carpo (1993-1997). Research and development. Fresh Mushroom X ray internal structure analyser. Conception, design, realisation and implementation of a complete solution (X-Ray devices, protocols, software, and teaching): X-ray image acquisition, film development and digitalization, image processing & registration, databases and embedded queries related to culture conditions, statistical analysis, and data management. France Champignon S.A., Beaufort en Vallée.

Software registration.

- QIZPP (Qt Image Zbuffer Post Processing). Inter Deposit Digital Number (IDDN) registration at Agence pour la Protection des Programmes (APP). In progress Owner: CIRAD (member 88.75.673). June 2012.
- GLOUPS (Generalized Operator for an Universal Plant Simulator). Inter Deposit Digital Number (IDDN) registration at Agence pour la Protection des Programmes (APP) under number no: IDDN.FR.001.210033.000.R.P.2011.000.30010. Owner: CIRAD (member 88.75.673). Logibox : 66948, May 27th, 2011.

CDROM, Communication and WebSites

- CDROM. "Initiation a l'imagerie volumique". Courses, References, Tools. 2001.
- CDROM. "Computer Graphics". Courses, Tools and References 2003-2006 (annual update).
- Liama's Short news (200-2003). Designer and main redactor. http://pma.cirad.fr/LIAMA_COM/

Web sites : Conception and development

GreenLab web site:

<http://greenlab.cirad.fr/>

GreenLab Online Course site:

<http://greenlab.cirad.fr/GLUVED> GreenLab StemGL Tool:

<http://greenlab.cirad.fr/StemGL>

LandMod2010 Mirror site (with proceedings)

<http://greenlab.cirad.fr/LandMod2010/> VLS_LRC project web site:

http://pma.cirad.fr/VLS_LRC

PMA09 International web site: <http://pma.cirad.fr>

Personal page: <http://agents.cirad.fr/index.php/Marc+Jaeger>

My "Best images" professional web site: <http://marcjaeg.free.fr> or

http://pma.cirad.fr/MJ_PICS/

Liama's web site (Phase 3, Archive): http://pma.cirad.fr/LIAMA_V3

Liama's Documents(2001->2006, Archive):

http://pma.cirad.fr/LIAMA_COM PMA'03 International web site

(Archive): <http://pma.cirad.fr/PMA03>

CIRAD/Scientific delegation Applied Mathematics and Computer Sciences -MIA (Archive in

French): http://pma.cirad.fr/DS_MIA/

EEC project STUD site (Archive): http://pma.cirad.fr/FP5_STUD/

CIRAD/AMAP MEB TEAM site (Archive in French): http://pma.cirad.fr/TEAM_MEB/

Languages:

- French (native)
- English,
- German (spoken),
- Chinese (very basic notions, spoken)