

33, Parc d'Ardenay  
91120 Palaiseau (France)  
☎ +33 (0) 601 201 668  
✉ mailsik@gmail.com  
🌐 www.massich.cat  
in massich  
🐦 jmassich  
👤 massich  
🎓 massich  
Born 15 March 1984

# Joan Massich

Research Engineer

*Interested in: signal processing, acquisition systems, their impact in medical application, and education.*

## Experience

Nov. 2017 –

**Research engineer**, *Parietal* - INRIA, Paris-saclay.

Core developer and maintainer of open-source scientific packages for neuro-physiological data in Python and C++: **MNE-Python**, **OpenMEEG**.

Also teaches software development and good practices in workshops and courses.

2017

**Open-source development**, *Le2i - Laboratoire Electronique, Informatique et Image UMR CNRS 6306 at IUT Le Creusot*, Le Creusot.

Core developer of **pydicom**; contributor to **scikit-learn**, **pytest**, and others.

Dec. 2013 – Dec. 2015

**Postdoctoral fellow**, *Le2i - Laboratoire Electronique, Informatique et Image UMR CNRS 6306 at IUT Le Creusot*, Le Creusot.

Computer vision and machine learning for medical imaging and industry inspection applications.

June 2009 – Dec. 2013

**Research assistant & PhD candidate**,

*Applied Vision Laboratory (AVL) at Texas Tech University (TTU);*

*ViCOROB - Computer Vision and Robotics group at University of Girona;*

*Le2i - UMR CNRS 6306 at IUT Le Creusot*.

## Teaching Experience and Academic Duties

Supervision  
& co-supervision

3 PhD students, 10+ graduate students.

Highlighted publications: signal processing applied to medical imaging (Rastgoo et al. 2016a; Lemaitre et al. 2015c) and to experimental physics (Belkacemi et al. 2015)

Dec. 2015 – Sep. 2016

**Attaché temporaire d'enseignement et de recherche (ATER)**, *Le2i - Laboratoire Electronique, Informatique et Image UMR CNRS 6306 at IUT Dijon*, Dijon.  
taught a combined 140 TP + 24 TD hours in Software Engineering, Web and mobile apps development, and architecture at bachelor level (in French).

## Projects

Sep. 2014 – Aug. 2016

**Early Mastery**, *European Project ref: 2014-1-ES01-KA201-004462*, Le Creusot.

Project manager for the local work package assigned to Université de Bourgogne.

Oct. 2014

**Strategic ALignment of Electrical and Information Engineering in European Higher Education Institutions (SALEIE)**, *European Project ref: 527877-LLP-1-2012-1-UK-ERASMUS-ENW*.

Participated in a study on the gap between different European institution curricula (Ligusova et al. 2014).

## Events

March. 2019

**Software Carpentry Workshop**, Saclay.  
Instructor and organizer of the workshop

Oct. 2015

**Doctoral Day**, Le Creusot.  
Creator of the event and Chair of the scientific committee (4 editions since)

Sep. 2010

**Medical Imaging Catalunya (MICAT)**, Girona.  
Session chair, board member of the scientific committee

Sep. 2009 – Aug. 2014

**Girona - First Lego League**.  
Board member of directors and Spanish FFL partner.

Sep. 2009 – Aug. 2014

**Underwater robotics workshops for kids and enthusiasts**, Girona.  
Member of the team who created and developed the activities.

## Education

Oct. 2009 – Dec. 2013

**PhD in Computer Vision**.  
*Universitat de Girona*, Girona, Catalonia.  
*Université de Bourgogne*, Le Creusot, France.  
title: Deformable object segmentation in ultra-sound images.  
grade: Excellent with honors.

Sept. 2007 – June 2009

**Erasmus Mundus Master Course on Computer Vision and Robotics (VI-BOT)**.  
*Heriot-Watt University*, Edinburgh, Scotland.  
*Universitat de Girona*, Girona, Catalonia.  
*Université de Bourgogne*, Le Creusot, France.  
grade: 8.1 over 10

Sept. 2005 – Sept. 2007

**Computer Science Engineering**,  
*Universitat de Girona*, Girona, Catalonia.  
grade: 7.7 over 10

## PhD Thesis

title *Deformable object segmentation in ultra-sound images*.  
supervisors Dr. Joan Martí and Prof. Fabrice Meriaudeau  
description My thesis was devoted to automatic segmentation of breast lesions in ultrasound images, since this task is key for the development of robust CAD systems applied to this organ and image modality. The proposed segmentation strategy divides the images into small meaningful regions that are contiguous, and uses optimization to label them based on training data and regularization criteria.

## Publications

h-index: 10 on Google scholar.

## in Medical Image Analysis

- Lemaitre, G., F. Meriaudeau, A. Meyer-Baese, R. Marti, K. Pinker-Domenig, P. Andrzejewski, P. A. T. Baltzer, and Joan Massich (Feb. 2018). "Computer-aided detection and diagnosis using multi-modal MRI for prostate cancer detection". In: *European Congress of Radiology (ECR)*. Vienna: Austria.
- Alsaih, Khaled, Guillaume Lemaitre, Mojdeh Rastgoo, Joan Massich, Désiré Sidibé, and Fabrice Meriaudeau (2017). "Machine learning techniques for diabetic macular edema (DME) classification on SD-OCT images". In: *Biomedical engineering online* 16.1, p. 68.
- Sidibé, Désiré, Shrinivasan Sankar, Guillaume Lemaître, Mojdeh Rastgoo, Joan Massich, Carol Y Cheung, Gavin SW Tan, Dan Milea, Ecosse Lamoureux, Tien Y Wong, et al. (2017). "An anomaly detection approach for the identification of DME patients using spectral domain optical coherence tomography images". In: *Computer Methods and Programs in Biomedicine* 139, pp. 109–117.
- Alsaih, Khaled, Guillaume Lemaître, Joan Massich, Mojdeh Rastgoo, Désiré Sidibé, Tien Y Wong, Ecosse Lamoureux, Dan Milea, Carol Y Cheung, and Fabrice Mériaudeau (2016). "Classification of SD-OCT volumes with multi pyramids, LBP and HOG descriptors: application to DME detections". In: *38th IEEE Engineering in Medicine and Biology Society (EMBC)*.
- Lemaitre, Guillaume, Mojdeh Rastgoo, Joan Massich, Joan C. Vilanova, Paul M. Walker, Jordi Freixenet, Anke Meyer-Baese, Robert Martí, and Fabrice Meriaudeau (Feb. 2016). "Normalization of T2W-MRI Prostate Images using Rician a priori". English. In: *SPIE Medical Imaging 2016*. San Diego, USA, pp. 978529–978529.
- Massich, Joan, Mojdeh Rastgoo, Guillaume Lemaitre, Carol Cheung, Tien Y Wong, Desire Sidibe, and Fabrice Meriaudeau (Dec. 2016). "Classifying DME vs normal SD-OCT volumes: A review". English. In: *23rd International Conference on Pattern Recognition (ICPR)*. Cancun: Mexico.
- Rastgoo, Mojdeh, Guillaume Lemaitre, Oliver Morel, Joan Massich, Frank Marzani, Rafael Garcia, and Desire Sidibe (Feb. 2016a). "Classification of melanoma lesions using sparse coded features and random forests". English. In: *SPIE Medical Imaging 2016*. San Diego, USA.
- Rastgoo, Mojdeh, Guillaume Lemaitre, Joan Massich, Oliver Morel, Frank Marzani, Rafael Garcia, and Fabrice Meriaudeau (Feb. 2016b). "Tackling the Problem of Data Imbalancing for Melanoma Classification". English. In: *3rd International conference on BIOIMAGING*. Rome, Italy.
- Lemaitre, Guillaume, Joan Massich, Robert Martí, Freixenet Jordi, J.C. Vilanova, P.M. Walker, Desire Sidibe, and Fabrice Meriaudeau (June 2015a). "A Boosting Approach for Prostate Cancer Detection using Multi-parametric MRI". English. In: *Proc. International Conference on Quality Ciontrol and Artificial Vision (QCAV)*. Le Creusot, France.
- Lemaitre, Guillaume, Mojdeh Rastgoo, Joan Massich, Desire Sidibe, and Fabrice Meriaudeau (Oct. 2015c). "Classification of SD-OCT volumes with LBP: Application to DME detection". English. In: *Proc. MICCAI 2015 Workshop on Ophthalmic Medical Image Analysis (OMIA)*. Munich, Germany.
- Massich, Joan, Guillaume Lemaitre, Joan Martí, and Fabrice Meriaudeau (Oct. 2015a). "An optimization approach to segment breast lesions in ultra-sound images using clinically validated visual cues". English. In: *Proc. MICCAI 2015 Workshop on Breast Image Analysis (BIA)*. Munich, Germany.
- Massich, Joan, Guillaume Lemaitre, Fabrice Meriaudeau, and Joan Martí (June 2015b). "Breast Ultra-Sound Image Segmentation: an Optimization approach based on super-pixels and high-level descriptors". English. In: *Proc. International Conference on Quality Ciontrol and Artificial Vision (QCAV)*. Le Creusot, France.
- Meyer-Baese, Anke, Joan Massich, Guillaume Lemaitre, and Mojdeh Rastgoo (Oct. 2015). "Real-Time Optical Flow with Theoretically Justified Warping Applied to Medical Imaging". English. In: *Proc. MICCAI 2015 Workshop on Ophthalmic Medical Image Analysis (OMIA)*. Munich, Germany.
- Massich, Joan, Fabrice Meriaudeau, Melcior Sentís, Sergi Ganau, Elsa Pérez, Domenec Puig, Robert Martí, Arnau Oliver, and Joan Martí (2014). "SIFT Texture Description for Understanding Breast Ultrasound Images". English. In: *Breast Imaging*. Ed. by Hiroshi Fujita, Takeshi Hara, and Chisako Muramatsu. Vol. 8539. Lecture Notes in Computer Science. Springer International Publishing, pp. 681–688.
- Massich, Joan (Dec. 2013). "Deformable object segmentation in ultra-sound images". PhD thesis. Girona (Catalunya): Universitat de Girona, Université de Bourgogne.
- Massich, Joan, Fabrice Meriaudeau, Melció Santís, Sergi Ganau, Elsa Pérez, Robert Martí, Arnau Oliver, and Joan Martí (July 2012). "Automatic seed placement for breast lesion segmentation on US images". English.

- In: *Breast Imaging*. Ed. by Andrew D.A. Maidment, Predrag R. Bakic, and Sara Gavenonis. Vol. 7361. Lecture Notes in Computer Science. Springer Berlin Heidelberg, pp. 308–315.
- Martí, Joan, Gubern-Mérida, Joan Massich, Arnau Oliver, Joan C. Vilanova, Josep Comet, Elsa Pérez, Arzoz M, and Robert Martí (2011). “Ultrasound Image Analysis. Methods and Applications.” In: *Recent advances in biomedical signal processing*. Ed. by Juan Manuel Górriz, Elmar W Lang, and Javier Ramírez. Bentham Science Publishers, pp. 216–230.
- Massich, Joan, Fabrice Meriaudeau, Elsa Pérez, Robert Martí, Arnau Oliver, and Joan Martí (Sept. 2011). “Seed selection criteria for breast lesion segmentation in ultra-sound images”. In: *Proc. MICCAI 2011 Workshop on Breast Image Analysis*. Ed. by Christine Tanner, Julia Schnabel, Nico Karssenmeijer, Mads Nielsen, Maryellen Giger, and Dawid Hawkes. Department of computer science (DIKU), University of Copenhagen, pp. 57–64.
- Massich, Joan, Fabrice Meriaudeau, Elsa Pérez, Robert Martí, Arnau Oliver, and Joan Martí (June 2010). “Lesion Segmentation in Breast Sonography”. English. In: *Digital Mammography*. Ed. by Joan Martí, Arnau Oliver, Jordi Freixenet, and Robert Martí. Vol. 6136. Lecture Notes in Computer Science. Springer Berlin Heidelberg, pp. 39–45.

### in Learning and Education

- Ligusova, Jana, Jean-Marc Thiriet, Joan Massich, Nina Bencheva, and Gert Jervan (Sept. 2014). “Reflections about the integration of global challenges into higher education future programs: application in the field of ICT security”. In: *Proceedings of ITHET 2014. 13th International Conference on Information Technology Based Higher Education and Training*.
- Cufí, Xevi, Miquel Villanueva, Andrés ElFakdi, Joan Massich, and Rafael Garcia (July 2012). “Team-based Building of a Remotely Operated Robot as a Method to Increase the Interest for Engineering among Secondary School Students”. In: *Proceedings of EDULEARN 2012. 4th International Conference on Education and New Learning Technologies*.
- Villanueva, Miquel, Xevi Cufí, Andrés ElFakdi, Joan Massich, and Rafael Garcia (2011). “Attracting talent to increase interest for engineering among secondary school students”. In: *Global Engineering Education Conference (EDUCON), 2011 IEEE*. IEEE, pp. 347–353.

### in Computer Vision and Others

- Belkacemi, M, J Massich, G Lemaitre, C Stolz, V Daval, G Pot, O Aubreton, R Collet, and F Meriaudeau (June 2016). “Wood fiber orientation assessment based on punctual laser beam excitation”. English. In: *13rd Quantitative Infrared Thermography Conference (QIRT)*. Gdansk, Poland.
- Belkacemi, Mohamed, Christophe Stolz, Alex andre Mathieu, Guillaume Lemaitre, Joan Massich, and Olivier Aubreton (2015). “Nondestructive testing based on scanning-from-heating approach: application to nonthrough defect detection and fiber orientation assessment”. In: *Journal of Electronic Imaging* 24.6, pp. 061112–061112.
- Lemaitre, Guillaume, A. Bikfalvi, J. Llach, Joan Massich, and F. Julian (Mar. 2015b). “Business Model Design for University Technology Valorisation”. English. In: *Proc. International Technology, Education and Development Conference (INTED)*. Madrid, Spain.
- Falcao, Gabriel, Natalia Hurtos, Joan Massich, and David Fofi (Feb. 2009). *Projector-camera calibration toolbox*. Comp. software. Le Creusot, France.
- Falcao, Gabriel, Natalia Hurtos, and Joan Massich (Dec. 2008). *Plane-based calibration of a projector-camera system*. Research rep. Le Creusot, France: Shape Recognition Statistics course (EMMc VIBOT).
- Hernández, Emili, Pere Ridao, Marc Carreras, David Ribas, Narcís Palomeras, Andrés El-fakdi, François Chung, Xavier Ribas, Guillermo García de Marina, Natalia Hurtós, Joan Massich, Antonio Almohaya, and Josep Vila (Oct. 2006). “ICTINEU AUV, un Robot per a Competir”. Catalan. In: *Artificial Intelligence Research and Development, Proceedings of the 9th International Conference of the ACIA, CCIA 2006*. Ed. by Monique Polit, Thierry Talbert, Beatriz López, and Joaquín Meléndez. Vol. 146. Frontiers in Artificial Intelligence and Applications. IOS Press.

Ribas, David, Narcís Palomeras, Xavier Ribas, Guillermo García de Marina, Emili Hernández, François Chung, Natalia Hurtós, Joan Massich, Antonio Almohaya, Josep Vila, and Andrés El-fakdi (2006). *ICTINEU AUV Takes the Challenge*. Research rep. Girona, Catalonia.

## Technical Skills

Languages	Python, C++, Matlab, Scratch
Technologies	Git, Travis, appveyor, circle, CMake, $\text{\LaTeX}$ , Vim, Emacs
Operating System	Windows, Linux (Gentoo)

## Languages

Catalan and Spanish (mother tongue), English (fluent), and French (spoken fluent and written business level)

## Awards

Sept. 2018

**Member of the team creator and promoter of underwater robotics workshop for kids, awarded with the *Jaume Vicens Vives distinction for the quality of university pedagogy*, Barcelona.**

Feb. 2016

**Best student paper award for, *Rastgoo et. al. "Classification of melanoma lesions using sparse coded features and random forests"*, Rome.**

Aug. 2006

**Member of the ViCOROB-UDG team: winner of the 2006 SAUC-E (Student Autonomous Underwater Challenge Europe) competition, London.**