

# Raphaël MARÉE

## Contact

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## Education

*Oct. 2000 - Feb. 2005*

PhD in Computer Science, University of Liège, Belgium.

Thesis title: “*Classification automatique d’images par arbres de décision*”  
 (“*Automatic Image Classification using Decision Trees*”).

*Sept. 1996 - Jul. 2000*

Master in Computer Science, University of Liège, Belgium.

Final Project: “*Conception d’une plate-forme de Data Mining distribuée*”  
 (“*Development of a distributed data mining platform using CORBA*”).

## Professional experiences

*2010-...* Postdoctoral Research fellow in Big Data, artificial intelligence (machine learning), (bio)image informatics, Cytomine.  
University of Liège, Montefiore Institute.

## Previous positions:

*2014-2015*

One year postdoc at Pasteur Institute  
Unité d’analyse d’images biologiques, Paris, France.

*2005-2014*

Management of the GIGA Bioinformatics core facility  
GIGA technology platforms, University of Liège.

## Professional activities

### Research and Development Experience:

- Design of novel tools using machine learning and distributed web software development for large-scale image recognition and big data analytics. Biomedical applications in the context of various diseases and biological processes.
- Analysis services for biomedical researchers (incl. on imaging data, high throughput proteomic mass-spectrometry data, clinical data) (2005-2014) related to various diseases and biological processes.
- Coordination of bioinformatics activities and infrastructure (high-performance computing cluster and mass storage) (2005-2014).

### Member of the organization committee of scientific meetings:

- 1st and 2nd Computational Pathology ECCB workshop (2016,2018)
- 14th International Congress for Stereology and Image Analysis (2015)
- 17th Benelux annual meeting on machine learning (2008)

### Scientific work evaluation:

- Program committee memberships: 1st and 2nd Computational Pathology ECCB workshop (2016, 2018), 14th International Congress for Stereology and Image Analysis (2015), ICML-UAI-COLT Workshop on Automated Interpretation and Modeling of Cell Images (2009), Benelearn (2008).
- Reviewer for international journals: IEEE Pattern Analysis and Machine Intelligence, Nature Methods, Bioinformatics, IEEE Transactions on Biomedical Engineering, IEEE Signal Processing Magazine, BMC Bioinformatics, Medical Image Analysis, Journal of Microscopy, ...
- Reviewer for international conferences/workshop: Computational Pathology MICCAI 2018, ISBI 2015-2017, IJCAI 2009, ECCB 2008, ECML-PKDD, ISVC, SGAI, ...
- Reviewer for European Research Council grants (2014).
- Follow-up PhD committee (2017-...), external member of PhD thesis jury (2016-...).

### Supervision:

- Since 2002, (co-)supervision of 2 PhD thesis and  $\pm 25$  MSc final projects about applications of machine learning algorithms to various problems in bioimage informatics, computer vision, and bioinformatics.
- Scientific coordination of Cytomine interdisciplinary project (2010-2016) involving computer scientists, researchers in biomedical sciences and anatomopathologists from 2 belgian universities.

### Research Valorization (technology transfer):

- Cytomine open-source software for multi-gigapixel collaborative analysis (<http://www.cytomine.org/>).

- Cytomine.coop (<http://www.cytomine.coop/>) co-founder (2017) (cooperative social enterprise providing services on top of Cytomine software).
- PEPITe co-founder (2002) (spin-off company specialized in knowledge extraction techniques for industrial processes).
- Development of algorithms for BestCyte Cell Sorter, project with CellSolutions LLC (<http://www.cellsols.com/>, USA) on cytology image analysis (under FDA approval process).
- Data analysis studies for international private companies through the GIGA Bioinformatics Core Facility.

Training support:

- Organization assistance for GIGA/Forem training on “Introduction to bioinformatics” and “Data analysis for bioinformatics” (2007, 2009).

## Selected publications

This selection includes a subset of peer-reviewed papers.

For more details see the complete list and our citation statistics.

PhD thesis:

- “*Classification automatique d’images par arbres de décision*”. Department of Electrical Engineering and Computer Science, University of Liège, Belgium, February 2005. (143 pages).

Invited book chapter:

- “*Extremely randomized trees and random subwindows for image classification, annotation, and retrieval*”. **Raphaël Marée**, Louis Wehenkel, Pierre Geurts. In Book “Decision Forests for Computer Vision and Medical Image Analysis”, Eds. A. Criminisi, J. Shotton, and E. Konukoglu. Springer, Advances in Computer Vision and Pattern Recognition series, pp. 125-141, 2013.

Journal papers:

- Methodological works in machine learning and bioimage informatics
  - “*Cytomine: towards an open and collaborative software platform for digital pathology bridged to molecular investigations*”. Ulysse Rubens, Renaud Hoyoux, Laurent Vanosmael, Mehdy Ouras, Maxime Tasset, Christopher Hamilton, Rémi Longuespée, **Raphaël Marée**. Accepted for publication in Proteomics Clinical Applications, Special Issue on Proteomics in Pathology, 2018.
  - “*Landmark detection in 2D bioimages for geometric morphometrics: a multi-resolution tree-based approach*”. Rémy Vandaele, Jessica Aceto, Marc Muller, Frédérique Peronnet, Vincent Debat, Ching-Wei Wang, Cheng-Ta Huang, Sébastien Jodogne, Philippe Martinive, Pierre Geurts, and **Raphaël Marée**. Nature Scientific Reports, 8:5, 38 (2018).

- “*The need for careful data collection for pattern recognition in digital pathology*”. **Raphaël Marée**. Journal of Pathology Informatics, 8:19, 2017.
- “*Towards Generic Image Classification using Tree-based Learning: an Extensive Empirical Study*”. **Raphaël Marée**, Pierre Geurts, and Louis Wehenkel. Pattern Recognition Letters, 2016.
- “*Collaborative analysis of multi-gigapixel images using Cytomine*”. **Raphaël Marée**, Loïc Rollus, Benjamin Stévens, Renaud Hoyoux, Gilles Louppe, Rémy Vandaele, Jean-Michel Begon, Philipp Kainz, Pierre Geurts, and Louis Wehenkel. Bioinformatics, 1;32(9):1395-401, 2016.
- “*Phenotype Classification of Zebrafish Embryos by Supervised Learning*”. Nathalie Jeanray, **Raphaël Marée**, Benoist Pruvost, Olivier Stern, Pierre Geurts, Louis Wehenkel, Marc Muller. PLoS One, 2015 Jan 9;10(1).
- “*Evaluation and Comparison of Anatomical Landmark Detection Methods for Cephalometric X-Ray Images: A Grand Challenge*”. Cheng-Ta Huang, Meng-Che Hsieh, Chung-Hsing Li, Sheng-Wei Chang, Wei-Cheng Li, Rémy Vandaele, **Raphaël Marée**, Sébastien Jodogne, Pierre Geurts, Cheng Chen, Guoyan Zheng, Chengwen Chu, Hengameh Mirzaalian, Ghassan Hamarneh, Tomaz Vrtovec and Bulat Ibragimov. IEEE Transactions on Medical Imaging, **34**(9):1890-1900, 2015.
- “*A rich internet application for remote visualization and collaborative annotation of digital slide images in histology and cytology*”. **Raphaël Marée**, Benjamin Stevens, Loïc Rollus, Natacha Rocks, Xavier Moles-Lopez, Isabelle Salmon, Didier Cataldo, Louis Wehenkel. BMC Diagnostic Pathology, Vol. 8 (Suppl. 1): S26, 2013.
- “*Automated processing of zebrafish imaging data - a survey*”. Ralf Mikut, Thomas Dickmeis, Wolfgang Driever, Pierre Geurts, Fred Hamprecht, Bernhard X. Kausler, Maria J Ledesma-Carbayo, **Raphaël Marée**, Karol Mikula, Periklis Pantazis, Olaf Ronneberger, Andres Santos, Rainer Stotzka, Uwe Strähle, Nadine Peyriéras. Zebrafish, 10:3, 2013.
- “*Content-based Image Retrieval by Indexing Random Subwindows with Randomized Trees*”. **Raphaël Marée**, Pierre Geurts, Louis Wehenkel. IPSI Transactions on Computer Vision and Applications, Volume 1, Number 1, page 46-57 - jan 2009
- “*Random Subwindows and Extremely Randomized Trees for Image Classification in Cell Biology*” **Raphaël Marée**, Pierre Geurts, Louis Wehenkel. BMC Cell Biology, supplement on Workshop of Multiscale Biological Imaging, Data Mining and Informatics, Volume 8, Number S1, 2007.
- Image analysis applications in biology/biomedecine
  - “*Inflammation-Generated Extracellular Matrix Fragments Drive Lung Metastasis*”. Sandrine Bekaert, Marianne Fillet, Benoît Detry, Muriel Pichavant, Raphael Marée; Agnès Noel, Natacha Rocks, and Didier Cataldo. Cancer Growth and Metastasis, 2017.

- “*Evaluation of BRCA1-related molecular features and microRNAs as prognostic factors for triple negative breast cancers*”. Meriem Boukerroucha, Claire Josse, Sonia El-Guendi, Bouchra Boujemla, Pierre Freres, **Raphaël Marée**, Stephane Wenric, Karin Segers, Joelle Collignon, Guy Jerusalem and Vincent Bours. BMC Cancer, **15**(755), 2015.
- “*The timing of surgery after neoadjuvant radiotherapy influences tumor dissemination in a preclinical model*”. N. Leroi, NE. Sounni, E. Van Overmeire, S. Blacher, **Raphaël Marée**, JA. Van Ginderachter, F. Lallemand, E. Lenaerts, PA. Coucke, A. Noel, Ph. Martinive. Oncotarget. 2015 Nov 3;6(34):36825-37.
- “*Zebrafish bone and general physiology are differently affected by hormones or changes in gravity*”. Jessica Aceto, Rasoul Nourizadeh-Lillabadi, **Raphaël Marée**, Nathalie Jeanray, Louis Wehenkel, Peter Alestrom, Jack van Loon, Marc Muller. PLoS ONE, 10(6): e0126928, 2015.
- “*Activation of the calcium-sensing receptor before renal ischemia / reperfusion exacerbates kidney injury*”. WEEKERS Laurent, De Tullio Pascal, BOVY Christophe, Poma Laurence, **Raphaël Marée**, BONVOISIN Catherine, Defraigne Jean-Olivier, Krzesinski Jean-Marie, Jouret François. American Journal of Translational Research, 7 128-135, 2015.
- “*Evaluation of CellSolutions’ BestPrep Automated Thin-Layer Liquid Based Cytology Pap Slide Preparation and BestCyte Cell Sorter Imaging System*”. Agnès Delga, Frédéric Goffin, Frédéric Kridelka, **Raphaël Marée**, Chantal Lambert, Philippe Delvenne . Acta Cytologica, Vol. 58, No. 5, 469-477, 2014.
- “*P2X1 ion channels promote neutrophil chemotaxis through Rho kinase activation*” Christelle Lecut, Kim Frederix, D.M. Johnson, C. Deroanne, M. Thiry, C. Faccineto, N. Ruzicka, **Raphaël Marée**, R.J. Evans, P. Volders, Vincent Bours, Cécile Oury. Journal of Immunology, Aug 15;183(4):2801-9, 2009.
- Proteomic/Genomic data analysis
  - “*Human Wharton’s jelly-derived stem cells display a distinct immunomodulatory and pro-regenerative transcriptional signature compared to bone marrow-derived stem cells*”. Raf Donders, Jeroen F.J. Bogie, Stylianos Ravanidis, Pascal Gervois, Marjan Vanheusden, **Raphaël Marée**, Marie Schrynemackers, Hubert J.M. Smeets, Jef Pinxteren, Kristel Gijbels, Sara Walbers, Robert W. Mays, Robert Deans, Ludo Van Den Bosch, Piet Stinissen, Ivo Lambrichts, Wilfried Gyselaers, and Niels Hellings. Accepted for publication in Stem Cells and Development, 2017.
  - “*Identification of protein biomarkers associated with cardiac ischemia by a proteomic approach*”. M. Fillet, C. Deroyer, G. Cobraiville, C. Le Goff, E. Cavalier, J. P. Chapelle, **Raphaël Marée**, V. Legrand, L. Pierard, Ph. Kohl, and M.-P. Merville, Biomarkers, Vol. 18, No. 7, Pages 614-624, 2013.
  - “*Structural Determinants of Specificity and Catalytic Mechanism in mammalian 25-kDa Thiamine Triphosphatase*”. David

Delvaux, Frédéric Kerff, Mamidanna R.V.S. Murty, Bernard Lakaye, Jan Czerniecki, Grégory Kohn, Pierre Wins, Raphaël Herman, Valérie Gabelica, Fabien Heuze, X. Tordoir, **Raphaël Marée**, André Matagne, Paulette Charlier, Edwin De Pauw, Lucien Bettendorff. Biochimica et Biophysica Acta - General Subjects, 1830(10), 2013.

- “*Discovery and biochemical characterisation of four novel biomarkers for osteoarthritis*”. Dominique deSeny, Mohammed Sharif, Marianne Fillet, Gaël Cibraiville, Marie-Alice Meuwis, **Raphaël Marée**, Jean-Philippe Hauzeur, Louis Wehenkel, Edouard Louis, Marie-Paule Merville, John Kirwan, Clio Ribbens, Michel Malaise. Annals of the Rheumatic Diseases, 2011
- “*Biomarker discovery in asthma-related inflammation and remodeling*”. Florence Quesada Calvo, Marianne Fillet, Dominique deSeny, Marie-Alice Meuwis, **Raphaël Marée**, Céline Crahay, Genevieve Paulissen, Natacha Rocks, Maud Gueders, Louis Wehenkel, Marie-Paule Merville, Renaud Louis, Jean-Michel Foidart, Agnès Noel, Didier Cataldo. Proteomics, Volume 9, Number 8, page 2163-2170, 2009.
- “*Predetector: a new tool to identify regulatory elements in bacterial genomes*” Samuel Hiard, **Raphaël Marée**, Séverine Colson, Paul A. Hoskinson, Fritz Titgemeyer, Gilles P. van Weeze, Bernard Joris, Louis Wehenkel, Sébastien Rigali. Biochemical and Biophysical Research Communications, Volume 357, Number 4, page 861-864, 2007.

Journal papers in french:

- “*Une méthode générique pour la classification automatique d’images à partir des pixels*”. **Raphaël Marée**, Pierre Geurts, and Louis Wehenkel. Revue des Nouvelles Technologies de l’Information, Numéro spécial Entreposage et Fouille de données, 1:227-238, June 2003. (12 pages).
- “*Un compilateur d’expressions mathématiques générant du MathML*”. Benjamin JENNES and **Raphaël MARÉE**. In Cahiers GUTenberg, 33-34, December 1999. (Invited paper; 7 pages).

Conference papers (peer-reviewed):

- “*Comparison of deep transfer learning strategies for digital pathology*”. Romain Mormont, Pierre Geurts, **Raphaël Marée**. Proc. IEEE CVPR Workshop on Computer Vision for Microscopy Image Analysis (CVMI), 2018. (8 pages)
- “*Automated multimodal volume registration based on supervised 3D anatomical landmark detection*”. Rémy Vandaele, François Lallemand, Philippe Martinive, Akos Gulyban, Sébastien Jodogne, Philippe Coucke, Pierre Geurts, **Raphaël Marée**, Proc. 12th International Conference on Computer Vision Theory and Applications (VISAPP), 2017. (8 pages).
- “*An approach for detection of glomeruli in multisite digital pathology*”. **Raphaël Marée**, Stéphane Dallongeville, Jean-Christophe

- Olivo-Marin, Vannary Meas-Yedid. Proc. IEEE International Symposium on Biomedical Imaging (ISBI, 2016. (4 pages).
- “*Détection automatique de glomérules en pathologie digitale*”. **Raphaël Marée**, Jean-Christophe Olivo-Marin, Vannary Meas-Yedid. GRETSI, 2015. (4 pages).
  - “*A hybrid human-computer approach for large-scale image-based measurements using web services and machine learning*”. **Raphaël Marée**, Loïc Rollus, Benjamin Stevens, Gilles Louppe, Olivier Caubo, Natacha Rocks, Sandrine Bekaert, Didier Cataldo, Louis Wehenkel. Proc. IEEE International Symposium on Biomedical Imaging (ISBI), 2014. (5 pages).
  - “*Automatic localization of interest points in zebrafish images with tree-based methods*”. Olivier Stern, **Raphaël Marée**, Jessica Aceto, Nathalie Jeanray, Marc Muller, Louis Wehenkel, Pierre Geurts. Proc. 6th International Conference on Pattern Recognition in Bioinformatics (PRIB), 2011. (12 pages).
  - “*Incremental Indexing and Distributed Image Search using Shared Randomized Vocabularies*”. **Raphaël Marée**, Philippe Denis, Louis Wehenkel, Pierre Geurts. Proc. 11th ACM International Conference on Multimedia Information Retrieval (MIR), 2010. (10 pages)
  - “*A Machine Learning Approach for Material Detection in Hyperspectral Images*” **Raphaël Marée**, Benjamin Stevens, Pierre Geurts, Yves Guern, Philippe Mack. Proc. 6th IEEE Workshop on Object Tracking and Classification Beyond and in the Visible Spectrum at CVPR, 2009. (6 pages)
  - “*Fast Multi-Class Image Annotation with Random Subwindows and Multiple Output Randomized Trees*” Marie Dumont, **Raphaël Marée**, Louis Wehenkel, Pierre Geurts Proc. International Conference on Computer Vision Theory and Applications (VISAPP), Volume 2, page 196-203, 2009. (8 pages).
  - “*Segment and combine: a generic approach for supervised learning of invariant classifiers from topologically structured data*“. Pierre Geurts, **Raphaël Marée**, Louis Wehenkel. Machine Learning Conference of Belgium and The Netherlands (Benelearn) - 2006. (9 pages).
  - “*Reinforcement learning with raw image pixels as input state*”. Damien Ernst, **Raphaël Marée**, Louis Wehenkel. International Workshop on Intelligent Computing in Pattern Analysis/Synthesis (IWICPAS), 2006. (9 pages).
  - “*Random Subwindows for Robust Image Classification*”. **Raphaël Marée**, Pierre Geurts, Justus Piater, Louis Wehenkel. In Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition (CVPR), Volume 1, page 34–40, June 2005, San Diego, USA. (7 pages).
  - “*A generic approach for image classification based on decision tree ensembles and local sub-windows*”. **Raphaël Marée**, Pierre Geurts, Justus Piater, Louis Wehenkel. In Proceedings of the 6th Asian Conference on Computer Vision (ACCV), Volume 2, page 860-865, January 2004, Jeju, Korea. (6 pages).

- “*A Comparison of Generic Machine Learning Algorithms for Image Classification*”. **Raphaël Marée**, Pierre Geurts, Giorgio Visimberga, Justus Piater, Louis Wehenkel. In Proceedings of AI-2003 (23rd SGAI International Conference on Innovative Techniques and Applications of Artificial Intelligence), December 2003, Cambridge, United Kingdom. (6 pages).

#### Abstracts:

- Abstracts or Extended Abstracts accepted at various conferences or workshops: European Conference on Digital Pathology (2014,2016), Benelux Bioinformatics Conference (2013), Conference on Pattern Recognition in Bioinformatics (PRIB 2011), BioImage Informatics Conference (2006, 2009, 2011, 2012, 2014), Machine Learning conference of Belgium and The Netherlands (Benelearn 2011,2016), Workshop on Microscopic Image Analysis with Applications in Biology (2011), International Conference on Intelligent Systems for Molecular Biology (2007), ...

#### Oral presentations (selected or invited)

- Workshop “1ère Journée autour des mathématiques et de l’informatique en analyse de données et d’imagerie en oncologie”, June 12th 2018, Nancy, France. **(Invited)**
- European Conference on Digital Pathology, May 30th, 2018, Helsinki, Finland.
- VIB Image processing workshop, 5th December 2017, Leuven, BE. **(Invited)**
- 4th Digital Pathology Congress, 30th Nov - 1st Dec 2017, London, UK. **(Invited)**
- NEUBIAS talk and open software showcase, 15-17th February, Lisbon, Portugal.
- Workshop ”Bioinformatics meets digital pathology” at ECCB, 3th September 2016, Den Hague, The Netherlands.
- Seminar at Image and Signal Processing Group, UCL, Louvain-La-Neuve, Belgium, 9th June 2016. **(Invited)**
- 13th European Congress on Digital Pathology (ECDP 2016), 25-28th May 2016, Berlin, Germany.
- AIDPATH workshop, 25th April 2016, Kortrijk, Belgium. **(Invited)**
- International Symposium on Biomedical Imaging (ISBI’16), 13-16th April 2016, Prague, Czech Republic.
- Med-e-Tel (International eHealth, Telemedecine and Health ICT forum), 6th April 2016, Luxembourg.
- Journée CNRS Traitement d’images en Microscopie, December 15th, UPMC, Paris, France.



- GDR MIV “Bioimage Informatics - Computational Phenotyping”, Pasteur Institute, 24th November 2015. **(Invited)**
- Digital Pathology Asia, Kuala Lumpur, September 22th 2015. **(Invited)**
- 14th International Congress for Stereology and Image Analysis, 9th July 2015
- GdR ISIS, Université Paris-Descartes (Paris 5), Paris, June 23rd 2015.
- European BioImage Analysis Symposium, Institut Curie, Paris, January 6th 2015.
- AIReWAY II IUAP scientific annual meeting, Liège, June 13th, 2014. **(Invited)**
- Cours Couleur, La Cambre, Brussels, May, 6th and 8th, 2014. **(Invited)**
- VIB Department of Plant Systems Biology, Ghent, February 14th, 2014. **(Invited)**
- Workshop Microscopie virtuelle, Ecole des Mines, Paris, February 5th, 2014
- Benelux Bioinformatics Conference, Brussels, 9th December 2013 **(Oral presentation prize winner)**
- Big Data workshop, UniGR, Luxembourg City, December 6th, 2013
- 3rd European Conference on Whole Slide Imaging and Analysis, Heidelberg, November 29 - 30, 2013
- Master Class Life Sciences Innovative Imaging of brain, body, and beyond, Hasselt University (Bioville), October, 16th, 2013 **(Invited)**
- Centre Ingenierie Biomedicale (LISA - Laboratories of Image, Signal processing and Acoustics), ULB, Brussels, October, 29th, 2013 **(Invited)**
- BioImage Informatics, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany, 18th September 2012
- 12th European Congress on Telepathology and 5th International Congress on Virtual Microscopy, Venice, Italy, 8th June 2012
- 2nd European Zebrafish PI Meeting, Karlsruhe Institute of Technology, Germany, 23rd March 2012
- International Conference on Multimedia Information Retrieval, Philadelphia, USA, 30th March 2010.
- IME Fraunhofer Institute, RWTH University, Aachen, 27th October 2009. **(Invited)**
- International Conference on Computer Vision Theory and Applications, Lisbon, Portugal, February 2009.

- Laboratoire d'Informatique de Paris 6, 14th May 2008.
- Asian Conference on Computer Vision, Tokyo, Japan, 22nd November 2007.
- Workshop on Multiscale Biological Imaging, Data Mining Informatics, UCSB, Santa Barbara, USA, 8th September 2006.
- Workshop on Intelligent Computing in Pattern Analysis/Synthesis, Xi'an, China, 27th August 2006.
- Workshop on Machine Learning Techniques for Processing Multimedia Content, Bonn, Germany, 11th August 2005.
- International Conference on Computer Vision and Pattern Recognition, San Diego, USA, June 2005.
- 4th GIGA (Interdisciplinary Cluster of Applied Geno-proteomics) Day, Montefiore Institute, University of Liège, 25th March 2004.
- 23rd SGAI International Conference, Cambridge, 16th december 2003.
- Journée de statistiques, Lyon, France, June 2003.

## Scientific awards, grants, and memberships

Member of the Management Committee and Workpackage Co-Lead for COST Action COMULIS: “Correlated Multimodal Imaging in Life Sciences”, 2018-2022.

“Runner-up for Best Paper” Award at the IEEE International CVPR Workshop on Computer Vision for Microscopy Image Analysis (CVMI) 2018 (with Romain Mormont and Pierre Geurts).

Member of the Management Committee for COST Action NEUBIAS: “A new Network of European BioImage Analysts to advance life science imaging”, 2015-2019.

BRAIN-be pioneer grant (with P.-Y. Desaive, MRBAB) from Belspo, 2015-2017.

Germaine Tillion research project grant (with Prof. D. Verpoorten, ..., ULg) from “Wallonie”, 2014-2017.

Mission scientifique (MIS) grant (ULg), 2014-2015.

Oral presentation prize winner, Benelux Bioinformatics Conference, 2013.

WIST3 research project grant (with Prof. Wehenkel, ..., ULg) from “Wallonie”, 2010-2016.

“Bourse Standard de Liège” from “Fonds Léon Frédéricq”, 2005-2007.

“FIRST-Doctorat” grant from “Wallonie”, 2000-2004.

Fernand Pisard grant, University of Liège, 1998-2000.

FNRS travel grants to participate to several conferences, 2005-....

Notable performances at scientific challenges:

- Second position at ISBI Automatic Cephalometric X-Ray Landmark Detection Challenge 2014 (with Remy Vandaele)
- Fourth position at 2nd International Competition on Cells Classification by Fluorescent Image Analysis (ICIP 2013)
- Fourth position at the ImageCLEF Medical Automatic Image Annotation Task, 2005.

### **Abroad stay and scientific events**

From 10/13/2014 to 10/12/2015 (12 months), Pasteur Institute, Paris, France. Data mining and image analysis methods for the discovery of clinically significant histological patterns: applications in nephrology.

From 09/19/2009 to 10/19/2009 (1 month), IME Fraunhofer Institute, RWTH Aachen. Evaluation of image classification techniques in the context of protein crystallization studies.

From 09/26/2005 to 09/30/2005 (1 week), participation to an advanced introductory course on modern biology, Genopole, Evry, France.

Since 2003, participation to several international conferences in computer vision, machine learning, data mining, and bioinformatics (cf. presentation list).

### **Collaborations**

I had/have several collaborations with researchers from GIGA Institute and University Hospital (Liège), Pasteur Institute (Paris), Medical University Graz, Université Pierre et Marie Curie (UPMC, Paris), Academic Medical Center (Amsterdam), Musées royaux des Beaux-Arts (Bruxelles), . . . . See the publication list and technology transfer for more details about collaborators.