

# GREGORY OPERTO, Ph. D.

33 year-old, French citizenship

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Grégory Operto has been actively engaged in neuroimaging since 2004. After graduating in 2005 from the Ecole Supérieure d'Ingénieurs de Luminy (now Polytech-Marseille) with a major in Biomedical Engineering, he received his PhD in Computer Science from Aix-Marseille University in 2009. He then joined NeuroSpin, the high-field MRI center of the Commissariat à l'Energie Atomique (Atomic Energy Commission). His research interests focus on brain intersubject variability in adults and early development, and more recently the aging brain and neurodegenerative disorders using large cohort studies. Between 2011 and 2016, he managed the production unit in charge of computing biomarkers in CATI, the French platform for multicenter neuroimaging studies. He is now holding a research associate position in the neuroimaging team of the BarcelonaBeta Brain Research Center to explore imaging early markers of Alzheimer's disease in large cohorts of presymptomatic subjects.

## QUALIFICATIONS

10-year experience in neuroimaging and brain data analysis

Design, implementation and production management of multi-site dataflows (data transfer, processing, quality control, communication)

Advanced knowledge of the Python language (software development and scientific computing)

Extended experience in managing large databases, big data processing and analysis in research

Excellent communication skills. Participations at international conferences and meetings, articles as first and co-author.

Supervision of students and engineers

## PROFESSIONAL EXPERIENCE

Postdoctoral researcher at BarcelonaBeta Brain Research Center – Pasqual Maragall Foundation (supervisor: J-D. Gispert, PhD), Barcelona (2016 –)

Postprocessing and analysis over massive MRI datasets, large-scale production of imaging biomarkers in the scope of Alzheimer's disease

Research Engineer / Production Manager in CATI (director: J-F. Mangin, PhD), NeuroSpin (2011–2016)

Creation of a national infrastructure for the support of cohort studies on Alzheimer's patients and related dementias (<http://cati-neuroimaging.com>).

Multi-site coordination of analyses performed on massive collections of images.

Member of the project executive committee.

Supervision of a software development team (3) focused on quality control.

Frequent interactions with teams in charge of national and international research projects.

Supervision of training engineers (2).

Postdoctoral Research Fellow in NeuroSpin CEA Saclay, France (2010–2011)

Working on classification and computer vision methods for the study of the cortical folding process and intersubject variability in developing brain.

Supervision: J-F. Mangin, PhD

PhD Student – Graduate Teaching Assistant, Université Aix-Marseille (2005–2009)

Doctoral training in neuroimaging (Laboratoire des Sciences de l'Information et des Systèmes)

functional magnetic resonance imaging, computer vision, machine learning, classification, machine learning, optimization

Training Engineer, Neurology Department 1st Medicine Faculty, Charles University, Prague, Czech Republic (2004)

Design of a video movement detection system during the acquisition of fMRI data – Application to studies in fMRI and repetitive transcranial magnetic stimulation (rTMS)

EDUCATION	<p><a href="#">Ph.D. in Computer Science</a> – <a href="#">Université Aix-Marseille</a>, 2005–2009          Thesis: Structural surface-based analysis of fMRI data          Supervision: Dr. Olivier Coulon, Ph.D – Prof. Rémy Bulot, Ph.D</p> <p><a href="#">Master's degree, Digital Imaging</a> – <a href="#">Université Aix-Marseille</a>, 2004–2005          Thesis: From a gyral parcellation to a cortical surface parameterization          Ranked 1st of promotion</p> <p><a href="#">Diplôme d'Ingénieur</a> (Biomedical Eng.), 2002–2005          Polytech-Marseille</p>
TRAINING	<p><a href="#">Neuroanatomy</a> (~ 50 hours) – Pr D. Hasboun – <a href="#">Université Pierre et Marie Curie</a>, Paris – 2013–2014</p> <p><a href="#">Agile software development (Scrum)</a> (~ 20 hours) – Valtech – 2014</p>
LANGUAGES	<p><a href="#">French</a> (native), <a href="#">English</a> (full professional proficiency), <a href="#">Spanish</a> (limited professional proficiency), <a href="#">Italian</a> (elementary proficiency)</p>
COMPUTER TECHNOLOGIES	<p>Extended knowledge of the <a href="#">Python</a> language and <a href="#">scientific computing</a> in <a href="#">Python</a> – Knowledge of <a href="#">C/C++</a>, <a href="#">Java</a>  <a href="#">Databases</a> (Sqlite, Postgresql) and <a href="#">web</a> (server/client, HTML5)  <a href="#">Experience in big data technologies</a> (machine learning, parallel computing, scalable databases)          Enthusiast <a href="#">Git/GitHub</a> user          Experience in agile project management (<a href="#">Scrum</a>) and software architecture design – Enthusiast about code quality          Experienced <a href="#">Linux</a> system administrator since 2004.</p>
NEUROIMAGING SOFTWARE	<p><a href="#">Statistical Parametric Mapping (SPM)</a>, <a href="#">FreeSurfer</a>, <a href="#">BrainVisa</a></p>
TEACHING	<p><a href="#">Computer Science</a>, <a href="#">Algorithmics</a>, <a href="#">Visualization in Scientific Computing</a>, <a href="#">Geometric Modeling</a>, <a href="#">Pattern Recognition</a>, <a href="#">Image Analysis</a>, from 2005 to 2009, <a href="#">Faculté des Sciences de Luminy</a>, <a href="#">Aix-Marseille University</a></p>
SUPERVISION OF STUDENTS	<p><a href="#">Pauline Bezivin</a> (2012 ; co-supervised Master student)  <a href="#">Samuel David</a> (2014 ; supervised Engineering student)  <a href="#">Alberto Redolfi</a> (2014 ; co-supervised Ph.D candidate)</p>
REVIEWER ACTIVITY	<p>International Symposium on Biomedical Imaging          Neuroimage          Organization for Human Brain Mapping (OHBM) annual meeting</p>
RESEARCH INTERESTS	<p>Intersubject variability          Computational anatomy          Cortical folding process, brain development, cortical morphology          Aging process and neurodegenerative diseases          Imaging markers          Multisite studies          Optimization of image processing dataflows over large cohorts          Quality Control on large databases</p>
PROFESSIONAL INTERESTS	<p>Machine learning          Computer vision          Software development in research</p>
HOBBIES	<p>Travels (Iceland, Norway, Hawaii, among the most recent)          Lightweight hiking, long-distance trekking (hiking solo without assistance from Marseille to Italy in 2012, across Mallorca in 2014, across the southern Alps in 2015)</p>

Hacking (Raspberry Pi, Arduino, attending BrainHack hackathons)  
Aikido, climbing, running (2 half-marathons per year since 2010)

## REFERENCES

**Dr. Juan Domingo Gispert López**, Ph.D (current supervisor)  
Head of neuroimaging research  
BarcelonaBeta Brain Research Center – Pasqual Maragall Foundation  
[jdgispert@fpmaragall.org](mailto:jdgispert@fpmaragall.org)

**Dr. Jean-François Mangin**, Ph.D (former supervisor)  
Director of the CATI platform  
Head of the Computer-assisted Neuroanatomy group,  
NeuroSpin – Atomic Energy Commission, Saclay, France  
[jean-francois.mangin@cea.fr](mailto:jean-francois.mangin@cea.fr)

**Dr. Olivier Coulon**, Ph.D. (Ph.D advisor)  
Head of the MeCA group  
Institut des Neurosciences de La Timone, Marseille, France  
[olivier.coulon@univ-amu.fr](mailto:olivier.coulon@univ-amu.fr)

## Peer-reviewed publications :

**G. Operto**, M. Chupin, B. Batrancourt, M.O Habert, O. Colliot, H. Benali, C. Poupon, C. Champseix, C. Delmaire, S. Marie, D. Rivière, M. Péligrini-Issac, V. Perlberg, R. Trebossen, M. Bottlaender, V. Frouin, A. Grigis, D. Papadopoulos Orfanos, H. Dary, L. Fillon, C. Azouani, A. Bouyahia, C. Fischer, L. Edward, M. Bouin, U. Thoprakarn, J. Li, L. Makkaoui, S. Poret, C. Dufouil, V. Bouteloup, G. Chételat, B. Dubois, S. Lehericy, J.F. Mangin, Y. Cointepas and the CATI Consortium, [CATI: A Large Distributed Infrastructure for the Neuroimaging of Cohorts](#), Neuroinformatics, 2016

C. Dufouil, B. Dubois, B. Vellas, F. Pasquier, F. Blanc, J. Hugon, O. Hanon, J-F Dartigues, S. Harston, A. Gabelle, M. Ceccaldi, O. Beauchet, P. Krolak-Salmon, R. David, O. Rouaud, O. Godefroy, C. Belin, I. Rouch, N. Auguste, D. Hannequin, A. Benetos, J. Pariente, M. Paccalin, O. Moreaud, C. Hommet, F. Sellal, M. Vercelletto, I. Jalenques, A. Gentric, P. Vandel, H. Savarieu, **G. Operto**, H. Bertin, M. Chupin, V. Bouteloup, M-O Habert, J-F Mangin, G. Chêne on behalf of the Memento cohort Study Group, [Spectrum of cognition and added value of biomarkers for early diagnosis of Alzheimer's disease and related disorders. The Memento cohort](#), Neurology, 2016 (submitted)

D. Germanaud, J. Lefèvre, C. Fischer, M. Bintner, A. Curie, V. des Portes, S. Eliez, M. Elmaleh-Bergès, D. Lamblin, S. Passemar, **G. Operto**, M. Schaer, A. Verloes, R. Toro, J.F. Mangin, L. Hertz-Pannier, [Simplified gyral pattern in severe developmental microcephalies? New insights from allometric modeling for spatial and spectral analysis of gyrification](#), Neuroimage, 2014

**G. Operto**, D. Rivière, B. Fertil, R. Bulot, J-F. Mangin, O. Coulon, [Structural Analysis of fMRI Data : A Surface-Based Framework for fMRI Multi-Subject Studies](#), Medical Image Analysis, 2012

P. Havránková, N.D. Walker, **G. Operto**, T. Sieger, J. Vymazal, R. Jech, [Cortical pattern of complex but not simple movements is affected in writer's cramp: a parametric event-related fMRI study](#), Clinical Neurophysiology, 2011

P. Havrankova, R. Jech, N.D. Walker, **G. Operto**, J. Tauchmanova, J. Vymazal, P. Dušek, M. Hromcik, E. Růžicka, [Repetitive TMS of the somatosensory cortex improves writer's cramp and enhances cortical activity](#), Neuro Endocrinology Letters, 2010

C. Clouchoux, D. Rivière, J-F. Mangin, **G. Operto**, J. Régis, O. Coulon, [Model-driven parameterization of the cortical surface for localization and inter-subject matching](#), Neuroimage, 2010

**G. Operto**, R. Bulot, J-L. Anton, O. Coulon, [Projection of fMRI data onto the cortical surface using anatomically-informed convolution kernels](#), Neuroimage, 2008

## Peer-reviewed conferences :

- S. Puch, A. Aduriz, A. Casamitjana, V. Vilaplana, P. Petrone, **G. Operto**, R. Cacciaglia, S. Skouras, C. Falcon, J.L. Molinuevo, J.D. Gispert, [Voxelwise nonlinear regression toolbox for neuroimage analysis: Application to aging and neurodegenerative disease modeling](#), Neural Information Processing Systems, Workshop on Machine Learning for Health, 2016
- G. Operto**, G. Auzias, A. Le Troter, M. Perrot, D. Rivière, J. Dubois, P. Hüppi, O. Coulon, J.-F. Mangin, [Structural Group Analysis of Cortical Curvature and Depth Patterns in the Developing Brain](#) (accepted for oral presentation), international symposium on biomedical imaging – ISBI, Barcelona, 2012
- O. Coulon, F. Pizzagalli, **G. Operto**, G. Auzias, C. Delon-Martin, M. Dojat, [Two new stable anatomical landmarks on the central sulcus: definition, automatic detection, and their relationship with primary motor functions of the hand](#), International Conference of the IEEE Engineering in Medicine and Biology Society – EMBC, 2011
- G. Operto**, B. Fertil, R. Bulot, O. Coulon, [Structural group analysis of brain functional data : assessing results significance](#), Medical Image Computing and Computer-Assisted Intervention – MICCAI – fMRI workshop, London, 2009
- G. Operto**, C. Clouchoux, R. Bulot, J.-L. Anton, O. Coulon, [Surface-based structural group analysis of fMRI data](#), Medical Image Computing and Computer-Assisted Intervention – MICCAI, New York City, 2008
- G. Operto**, [Noyaux de convolution constraints par l'anatomie pour la projection de données IRMf sur la surface corticale](#), Journées Du Laboratoire LSIS 2007, Giens, 2007
- G. Operto**, R. Bulot, J.-L. Anton, O. Coulon, [Anatomically informed convolution kernels for the projection of fmri data on the cortical surface](#), Medical Image Computing and Computer-Assisted Intervention – MICCAI, Copenhagen, 2006
- Chapters in book :
- J.-F. Mangin, M. Perrot, **G. Operto**, C. Fischer, J. Lefèvre, D. Rivière, [Sulcus Identification and Labeling](#), In [Brain Mapping](#), edited by Arthur W. Toga, Academic Press, Waltham, 2015, Pages 365–371, ISBN 9780123973160, <http://dx.doi.org/10.1016/B978-0-12-397025-1.00307-9>.
- Abstracts and posters :
- C Dufouil, JF Mangin, G Operto, P Amouyel, B Dubois, B Vellas, F Pasquier, JF Dartigues, M Ceccaldi, F Blanc, A Gabelle, P Krolak-Salmon, J Hugon, O Hanon, O Rouaud, R David, M Chupin, G Chêne for the Memento Study group, [Are Alzheimer's Disease Risk Genes related to markers of brain pathology? The Memento cohort](#), Alzheimer's Association International Conference, 2016 (submitted)
- G. Operto**, C. Fischer, S. David, M. Bouin, L. Fillon, C. Champseix, J.-F. Mangin, [SnapBase/SnapCheck: Assisting Quality Control of Post-processing Results over Large Cohorts](#), Human Brain Mapping, Honolulu, 2015
- C. Dufouil, M. Chupin, S. Auriacombe, H. Savarieu, B. Dubois, F. Pasquier, F. Blanc, J. Hugon, O. Hanon, A. Gabelle, M. Ceccaldi, O. Beauchet, P. Krolak Salmon, R. David, O. Rouaud, O. Codefroy, C. Belin, I. Rouch, D. Wallon, A. Benetos, M. Paccalin, M. Sauvée, L. Fillon, C. Hommet, F. Sellal, M. Vercelletto, I. Jalenques, A. Gentric, P. Vandel, V. Bouteloup, **G. Operto**, C. Thomas-Anterion, S. Belliard, J.-F. Mangin, P.-J. Ousset, G. Chene, [Age differences in the association of white matter lesions with the occurrence of dementia: The memento cohort](#), Alzheimer's & Dementia, Volume 11, Issue 7, Supplement, July 2015, Pages P678–P679, ISSN 1552–5260, <http://dx.doi.org/10.1016/j.jalz.2015.06.1008>.
- L. Edward, **G. Operto**, S. Poret, Y. Cointepas, N. Cheaib, L. Makkaoui, B. Batrancourt, [OntoCATI: Towards an ontology of neuroimaging measures in the CATI Platform](#), Frontiers in Neuroinformatics, Stockholm, 2013
- C. Fischer, **G. Operto**, S. Laguitton, M. Perrot, I. Denghien, D. Rivière, J.-F. Mangin, [Morphologist 2012: The new morphological pipeline of BrainVisa](#), Human Brain Mapping, Beijing, 2012

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- G. Auzias, O. Colliot, J-A. Glaunès, **G. Operto**, J-F. Mangin, A. Trouvé, S. Baillet, [Diffeomorphic registration of functional data using sulcal landmarks : DISCO is born to be alive](#), Human Brain Mapping, Barcelona, 2010
- L. Favre, A.L. Fouque, T. Vincent, A. Tucholka, M. Keller, **G. Operto**, B. Thyreau, C. Clouchoux, L. Risser, A. Moreno, D. Geoffroy, Y. Cointepas, O. Coulon, P. Ciuciu, B. Thirion, A. Roche, [A Comprehensive fMRI Processing Toolbox for BrainVISA](#), Human Brain Mapping, 2009
- P. Kochunov, J. Lancaster, S. Narayana, **G. Operto**, O. Coulon, J-F. Mangin, P. Fox, [Relationship between regional FDG uptake and other markers of cerebral health in normal aging](#), Human Brain Mapping, 2007
- G. Operto**, C. Clouchoux, J-L. Anton, A. Cachia, K. Dauchot, A. Sirigu, R. Bulot, O. Coulon, [Cortical localization by surface parameterization : a gyrus-based approach](#), Human Brain Mapping, Florence, 2006
- O. Coulon, C. Clouchoux, **G. Operto**, K. Dauchot, A. Sirigu, J-L. Anton, [Cortical localization by surface parameterization : a sulcus-based approach](#), Human Brain Mapping , Florence, 2006
- C. Clouchoux, O. Coulon, **G. Operto**, D. Riviere, K. Dauchot, A. Sirigu, J-L. Anton, J. Régis, [Cortical localization via hemisphere surface parameterization](#), Human Brain Mapping, Florence, 2006
- P. Havrankova, R. Jech, N. Walker, **G. Operto**, P. Dušek, J. Vymazal, [Cortical involvement in active and passive motions in graphospasm](#) , Human Brain Mapping , Florence, 2006
- P. Havrankova, R. Jech, N. Walker, **G. Operto**, P. Dušek, J. Vymazal, [Active and passive motion in patients with graphospasm: an event-related fMRI study](#), 16th International congress of Parkinson's disease and related disorders, Berlin, 2005
- R. Jech, L. Nováková, N. Walker, **G. Operto**, J. Roth, J. Vymazal, E. Růžicka, [Postanoxický Myoklonus v Obraze Event-Related fMRI - Kazuistika](#) , 19th Czech and Slovak Neurological Congress, Brno, 2004