



Michaël Bernier

PH.D. CANDIDATE · BIOMEDICAL IMAGING AND IMAGE PROCESSING

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Skills

General Leadership, Decision making, Creativity, Expertise in image processing

Spoken languages French, English

Neuroscience tools AFNI, FSL, ANTs, SPM, MATLAB, Python toolboxes, Freesurfer

Neuroscience acquisitions fMRI, VASO, ASL, SWI, ToF, MRI, dMRI, PET, EEG

Platforms (OS) OSX, Neurodebian, Linux Mint, Windows

Programming languages C++, C, C#, Bash, Python, Matlab, LaTex, OpenGL, OpenMP, OpenCV

Software suites Adobe, Git, Office, Overleaf

Education

Université de sherbrooke

CHUS Fleurimont, QC, CA

PH.D. RADIATION SCIENCES AND BIOMEDICAL IMAGING

2014 - PRESENT

Supervisors: Kevin Whittingstall, Stephen Cunnane

Project: The influence of structure on functional imaging and brain metabolism

Description: Determination of a fMRI metric related the glucose metabolism measured by PET-FDG; Development of acquisitions and processing pipeline for simultaneous VASO-BOLD, SWI and ToF to explore the relation between vasculature and functional imaging; Development of a venous and arterial atlas based on SWI and ToF acquisitions.

Université de sherbrooke

CHUS Fleurimont, QC, CA

M.Sc. RADIATION SCIENCES AND BIOMEDICAL IMAGING

2009 - 2012

Supervisors: Maxime Descoteaux, Martin Lepage, Roger Lecomte

Project: Automated multimodal registration for small animal PET and MRI

Description: Development of a multi-resolution technique to automatically align small animal PET and MRI acquisitions.

Université de sherbrooke

Sherbrooke, QC, CA

B.Sc. COMPUTER SCIENCE IN IMAGE PROCESSING AND INFOGRAPHICS

2005 - 2008

Academic projects:

All of tasks planning based on genetic algorithms ; Real-time augmented reality system based on webcam ; Toolbox containing multiple computer stereovision algorithm ; Computer animation of an articulated arm based on inverted cinematic ; Video analysing software for detection of movement and object tracking ; Image and video compression system (CODEC) ; Voice recognition program ; Image-based search engine

Scientific Experiences

Lecturer & Course planner

Université de Sherbrooke, QC, CA

B.Sc. IN COMPUTER SCIENCE

2009 - Present

- **IMN 659** Video Processing (6 sessions) + redaction of all materials
- **IMN 638** Augmented Reality (1 session)
- **IMN 428** Infographics (1 session)
- **IMN430** Visualization (1 session)
- **IMN 697** Research Project (Supervision)

Research assistant (Level III - Research scientist)

Université de Sherbrooke, QC, CA

LAB OF KEVIN WHITTINGSTALL, CHUS FLEURIMONT

2011 - August 2014

Tasks: fMRI acquisitions and processing pipeline development, EEG acquisitions and preprocessing; Student supervision; Scientific paper and scholarship redactions.

INTERSHIPS & RELATED EXPERIENCES

2009	Teacher's auxiliary , Université de Sherbrooke	Sherbrooke, QC, CA
2008	Research programmer , CHUS Fleurimont	Sherbrooke, QC, CA
2007	Teacher's auxiliary , CAE	Montréal, QC, CA

Workshops and formations

2016	Microstructure workshop	Montréal, QC, CA
2013	Pulse programming (PPE), Phillips 3T	Nashville, TN
2013	SDM, Data Handling and GPI training, Phillips 3T	Nashville, TN
2012	Summer school (Basic and Advanced fMRI)	Montréal, QC, CA
2012	Nvidia GPU programming Workshop	Montréal, QC, CA

Honors & Awards

HONORS

2017	ISMRM Magna cum laude award , International Society for Magnetic Resonance in Medicine	International
2016	Outstanding Reviewer (J. Neurosci. Meth.) , Elsevier	International
2014	3rd place "Une image vaut mille décors" , Centre de recherche clinique Étienne-Le Bel	Sherbrooke, QC, CA

SCHOLARSHIPS

2015	NSERC Postgraduate Scholarships - Doctoral Program (PGS D)	63000\$	Canada
2014	FQRNT Fonds de recherche du Québec – Nature et technologies (refused)	60000\$	Québec, CA
2014	Centre de recherche du centre hospitalier universitaire de Sherbrooke (CRCHUS)	7200\$	Sherbrooke, QC, CA

TRAVEL AWARDS

2017	CNS – Travel Award	500\$	Sherbrooke, QC, CA
2017	QBIN – Travel Award	500\$	Québec, CA
2016	QBIN – Travel Award	500\$	Québec, CA
2015	QBIN – Travel Award	500\$	Québec, CA
2014	Research Assistant Travel Award	2000\$	Sherbrooke, QC, CA
2012	Research Assistant Travel Award	1000\$	Sherbrooke, QC, CA
2011	QBIN – Travel Award	500\$	Québec, CA
2011	Faculty of medicine Travel Award	500\$	Sherbrooke, QC, CA
2011	CNS – Travel Award	500\$	Sherbrooke, QC, CA

Research Articles

ARTICLES IN PREPARATION

- [R1] **Bernier M.**, Gilbert G., Cunnane C.S., Whittingstall K., *The vascular composition of VASO-BOLD resting-state networks using ToF and SWI at 3T*, **Human Brain Mapping**, 2017 (I.F.: 6.924, *in prep.*)
- [R2] **Bernier M.**, Rautenbach I., Whittingstall K., *The impact of vasculature on fMRI activations in a elderly population*, **Journal of Cerebral Blood Flow and Metabolism**, 2017 (I.F.: 4.929, *in prep.*)

PEER-REVIEWED JOURNAL ARTICLES (FIRST AUTHOR)

- [R3] **Bernier M.**, Croteau É., Castellano C.-A., Cunnane S.C., Whittingstall K., *Spatial distribution of resting-state BOLD regional homogeneity as a predictor of brain glucose uptake: A study in healthy aging*, **Neuroimage**, 2017 (I.F.: 5.463)
- [R4] **Bernier M.**, Gauvreau C., Thériault D., Madrolle S., Lepage J.-F., Whittingstall K., *Increased BOLD activation in the left parahippocampal cortex after 1 year of medical school*, **Neuroreport**, 2016 (I.F.: 1.644)
- [R5] **Bernier M.**, Chamberland M., Houde J.-C., Descoteaux M., Whittingstall K., *Using fMRI non-local means denoising to uncover activation in sub-cortical structures at 1.5 T for guided HARDI tractography*, **Frontiers in Hum. Neuro.**, 2014 (I.F.: 2.9)

PEER-REVIEWED JOURNAL ARTICLES (CO-AUTHOR)

- [R6] Lagueux É., **Bernier M.**, Bourgault P., Whittingstall K., Mercier C., Léonard G., Laroche S., Tousignant-Laflamme Y., *The effectiveness of transcranial direct current stimulation as an add-on modality to graded motor imagery for treatment of complex regional pain syndrome: A randomized proof of concept study*, **Clinical journal of Pain**, 2017 (I.F.:2.703)
- [R7] Bizeau A., Gilbert G., **Bernier M.**, Tung Huynh M., Descoteaux M., Whittingstall K., *The impact of vasculature on fMRI activations in a elderly population*, **Journal of Cerebral Blood Flow and Metabolism**, 2017 (I.F.: 4.929)
- [R8] Renaud E., Descoteaux M., **Bernier M.**, Whittingstall K., *Semi-Automatic Segmentation of Optic Radiations and LGN, and Their Relationship to EEG Alpha Waves*, **PLOS one**, 2016 (I.F.: 3.234)
- [R8] Chamberland M., **Bernier M.**, Fortin D., Descoteaux M., Whittingstall K., *3D interactive tractography-informed resting-state fMRI connectivity*, **Frontiers in Neuroscience**, 2014 (IF: 3.398)
- [R9] Vigneau-Roy N., **Bernier M.**, Descoteaux M., Whittingstall K., *Regional variations in vascular density correlate with resting-state et task-evoked blood oxygen level-dependent signal amplitude*, **Human Brain Mapping**, 2013 (IF: 6.984)
- [R10] Whittingstall K., **Bernier M.**, Houde J.-C., Descoteaux M., *Structural network underlying visuospatial imagery in humans*, **Cortex**, 2013 (IF: 6.042)

OTHER PUBLISHED DOCUMENTATIONS

- [D1] **Bernier M.**, , **IMN659 - Video Processing class material and homeworks (45 hours of material)**, 2010
<http://michaelbernier.github.io/>

Presentations

ORAL PRESENTATIONS

- [O1] **Bernier M.**, Gilbert G., Cunnane C.S., Whittingstall K., *Simultaneous multi-slice whole-brain VASO-BOLD, ToF, and SWI at 3T to investigate the vascular contributions in resting-state networks*, **ISMRM 25th, Hawaii, USA, 2017**
- [O2] **Bernier M.**, Croteau É., Castellano C.-A., Cunnane C.S., Whittingstall K., *BOLD local synchrony as a strong proxy of glucose uptake and as a biomarker of aging using functionally-driven parcelization*, **ISMRM 24th, Singapore, 2016**

POSTER PRESENTATIONS

- [P1] Bizeau A., Gilbert G., Tung Huynh M., **Bernier M.**, Bocti C., Descoteaux M., Whittingstall K., *Arterial segmentation and visual stimulus-induced changes in diameter observed in the human brain*, **ISMRM 24th, Singapore, 2016**
- [P2] **Bernier M.**, Croteau É., C.-A. Castellano, Cunnane C. S., Whittingstall K., *Resting-state BOLD amplitude (ALFF) is a poor predictor of PET-FDG measure of brain activity*, **OHBM 21th, Hawaii, USA, 2015**
- [P3] Chamberland M., **Bernier M.**, Fortin D., Whittingstall K., Descoteaux M., *Tractography-driven resting-state fMRI for investigating inter-subject variability*, **OHBM 21th, Hawaii, USA, 2015**
- [P4] **Bernier M.**, Chamberland M., C.-A. Castellano, Cunnane C. S., Whittingstall K., *Uncovering sub-cortical functional networks involving deep-brain structures using Non-Local Means denoising at 1.5T*, **ISMRM 23th, Toronto, CA, 2015**
- [P5] Chamberland M., **Bernier M.**, Fortin D., Whittingstall K., Descoteaux M., *Interactively computing and visualizing functional and structural brain connectivity in real-time*, **ISMRM 23th, Toronto, CA, 2015**
- [P6] **Bernier M.**, Whittingstall K., *fMRI denoising using non-local means to uncover activation in sub-cortical structures at 1.5 T*, **OHBM 20th, Hambourg, Germany, 2014**
- [P7] Chamberland M., **Bernier M.**, Fortin D., Whittingstall K., Descoteaux M., *Uncovering a visuospatial network at rest*, **OHBM 20th, Hambourg, Germany, 2014**
- [P8] Renaud E., **Bernier M.**, Garyfallidis E., Descoteaux M., Whittingstall K., *Towards an automatic segmentation of the LGN: fiber bundle filtering technique*, **OHBM 20th, Hambourg, Germany, 2014**
- [P9] **Bernier M.**, Whittingstall K., *Functional connectivity of fMRI activation clusters projected in resting state-space*, **OHBM 18th, Beijing, China, 2012**
- [P10] Vigneau-Roy N., **Bernier M.**, Descoteaux M., Whittingstall K., *Link between function et structure in the resting-state brain : an fMRI et VBM study*, **OHBM 18th, Beijing, China, 2012**
- [P11] Vigneau-Roy N., **Bernier M.**, Descoteaux M., Whittingstall K., *Combining parallel multiresolution et PCA initialisation for a fully automatic PET-MRI registration*, **ISMRM 19th, Montréal, Québec, 2011**

INVITED PRESENTATIONS

[I1] **Bernier M.**, *Link between function et structure in the resting-state brain*, INRIA, Bordeaux, France, 2014

Reviewer

PEER-REVIEWED JOURNAL ARTICLE REVIEWS

[J1] Journal of Neuroscience Methods, 2015-2017 (13 articles)

Student Supervision

PRINCIPAL SUPERVISOR

2012	Blais, Julien , Project for end of undergrad studies	Sherbrooke, QC, CA
2012	Tardif, Simon , Project for end of undergrad studies	Sherbrooke, QC, CA
2012	Bilodeau, Vincent , Project for end of undergrad studies	Sherbrooke, QC, CA
2012	Garant-Amyot, Maxime , Project for end of undergrad studies	Sherbrooke, QC, CA
2012	Charbonneau, Luc , Project for end of undergrad studies	Sherbrooke, QC, CA

CO-SUPERVISOR

2017	Rautenbach, Ignatius , Summer internship	Sherbrooke, QC, CA
2012	Madrolle, Stéphanie , Master degree internship	Sherbrooke, QC, CA
2010	Bellavance, Patrick , Project for start of undergrad studies	Sherbrooke, QC, CA

ACADEMIC ADVISOR

2014	Chamberland, Maxime , M.Sc. project co-supervision and advisor, ended in 2016	Sherbrooke, QC, CA
2014	Trottier-Duclos, François , M.Sc. project advisor	Sherbrooke, QC, CA
2013	Renaud, Emmanuelle , M.Sc. project co-supervision and advisor, ended in 2015	Sherbrooke, QC, CA
2013	Auclair, Vincent , M.Sc. project co-supervision and advisor	Sherbrooke, QC, CA
2012	Vigneau-Roy, Nicolas , M.Sc. project co-supervision and advisor, ended in 2013	Sherbrooke, QC, CA
2012	Noël-Laramy, Maxime , M.Sc. project co-supervision and advisor	Sherbrooke, QC, CA

Extracurricular Activity

KNOWLEDGE AND TECHNOLOGY TRANSLATION

IMEKA

Université de Sherbrooke

MEMBER AND STUDENT SUPERVISOR

2010

Participation in the creation of IMEKA, supervising the first programmer intern.

Plateforme d'Analyse et de Visualisation d'Image (PAVI)

Université de Sherbrooke

SOFTWARE PROGRAMMER

2012

Contributed a PET-MRI registration software for the PAVI

COMMUNITY AND VOLUNTEER ACTIVITIES

Neo-canadian community service

Sherbrooke, QC, CA

EVENT PHOTOGRAPHER

2011

Event photographer for activities related to the integration of new immigrants and refugees