

# MAXIME CHAMBERLAND

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chamberm.github.io

Languages: French, English

## Studies

- **Cardiff University** UK  
*Post-doctoral fellow* 2017-
  - Research topic: Diffusion MRI tractography methods
  - Supervisors: Derek. K. Jones
- **University of Sherbrooke** Canada  
*Ph.D - Radiation sciences & Biomedical Imaging* 2013-2017
  - Research topic: Diffusion and functional MRI visualization & neurosurgical applications
  - Supervisors: Maxime Descoteaux (Ph.D), Kevin Whittingstall (Ph.D), David Fortin (M.D)
- **University of Sherbrooke** Canada  
*M.Sc - Computer Science - Medical imaging* 2011-2013
  - Research topic: Real-time fiber tractography
  - Supervisor: Maxime Descoteaux (Ph.D)
- **University of Sherbrooke** Canada  
*B.Sc - Digital Imaging Science including 4 internships* 2007-2010

## Work Experience

- **University of Sherbrooke** Sherbrooke, Qc  
*Lecturer - Visual and digital interactions (IMN638)* 2014
- **University of Sherbrooke** Sherbrooke, Qc  
*Teaching fellow - Digital media acquisition (IMN117)* 2011-2014
- **Borealis [www.boreal-is.com](http://www.boreal-is.com)** Magog, Qc  
*R&D developer* 2010
- **Canadian Space Agency [www.asc-csa.gc.ca](http://www.asc-csa.gc.ca)** St-Hubert, Qc  
*Web developer* 2008-2009

## Reviewing expertise

NeuroImage, Neuromage Clinical, Human Brain Mapping, PLoS One, Frontiers, Medical Image Analysis, Behavioral and brain functions, The Open Neuroimaging Journal, International Journal of Neural Systems, MICCAI 2015

## International presentations

- 2017** Invited speaker, Prof: Rachid Deriche, Computational Brain Connectivity Mapping, Winter School Workshop, Juan-les-Pins, France.
- 2016** Invited speaker, Image Sciences Institute, Prof: Alexander Leemans, PROVIDIlab, UMC Utrecht, Netherlands.
- 2016** Invited speaker, CUBRIC Cardiff University Brain Research Imaging Centre, Prof: Derek Jones, Cardiff, UK.

- 2015** Invited speaker, CRL - Boston Children's Hospital (Harvard Medical School), Prof: Simon Warfield, Boston, USA.
- 2015** Invited speaker, Center for Brain Imaging, Prof: Fernando Boada, NYU, New York, USA.
- 2015** Invited speaker, Department of Mathematics and Computer Science, Prof: Luc Florack, TUE, Eindhoven, Netherlands.
- 2014** Invited speaker, Sophia-Antipolis (INRIA), Prof: Rachid Deriche, Nice, France.
- 2014** Neurotechnix conference, Oral presentation (Best student paper award), Rome, Italy.
- 2013** Sherbrooke/Boston meeting, Laboratory of Mathematics in Imaging (Harvard Medical School), Prof: C-F Westin, Boston, USA.
- 2013** Sherbrooke/Boston meeting, CRL - Boston Children's Hospital (Harvard Medical School), Prof: Simon Warfield, Boston, USA.

### Visiting researcher

- 2016** Cardiff University Brain Research Center (CUBRIC) UK. Topic: Real-time connectomics. Supervisor: Derek. K. Jones, 2 months.
- 2015** Boston Children's Hospital, Harvard Medical school, Computational Radiology Lab. Topic: Surgical application of interactive tractography. Supervisors: Simon Warfield, Benoit Scherrer, 6 months.
- 2015** UMC - Utrecht (The Netherlands). Topic: Real-time orientation-dependent opacity rendering of fiber tractography. Supervisor: Alexander Leemans (PROVIDILab), 2 months.

### Scholarships, awards and prizes

- 2018 BRAIN** Travek award: Guarantors of Brain (1000\$)
- 2018 ISMRM** Educational stipend, Paris (475\$)
- 2017 CRSNG** Post-doctoral fellowship (90 000\$ for 2 years, ranked 1st).
- 2017 UdeS** Publication award: Sherbrooke Neuroscience Center (500\$)
- 2016 UdeS** Travel award: Sherbrooke Neuroscience Center (500\$)
- 2016 QBIN** Training abroad award: Quebec Bio-Imaging Network (4000\$)
- 2016 FQRNT** Publication award: Chercheurs étoiles (1000\$)
- 2016 ISMRM** Educational stipend, Singapore (475\$)
- 2015 UdeS** Publication award: Sherbrooke Neuroscience Center (500\$)
- 2015 CRSNG** Michael Smith Foreign Study Supplements Program (6000\$)
- 2015 QBIN** Travel award: Quebec Bio-Imaging Network (500\$)
- 2015 UdeS** Publication award: Sherbrooke Neuroscience Center (500\$)
- 2015 UdeS** Travel award: Sherbrooke Neuroscience Center (500\$)
- 2015 ISMRM** Educational stipend, Toronto, Canada. (460\$).
- 2014 UdeS** People's choice, 6th Sherbrooke Neuroscience Center day (500\$)

**2014 Neurotechnix** Best student paper award: Rome, Italy.

**2014 QBIN** Travel award: Quebec Bio-Imaging Network (500\$)

**2014 CRSNG** Ph.D scholarship: Alexander-Graham-Bell BESC-D (105 000\$ for 3 years).

**2014 FQRNT** Ph.D scholarship: FQRNT (40 000\$ for 2 years, kindly declined).

**2013 UdeS** Ph.D scholarship: FMSS (57 000\$ for 3 years, kindly declined).

**2013 UdeS** Best student poster: CIMS (300\$)

**2013 ACFAS** Best picture: Eurêka festival (1500\$)

**2013 UdeS** Best picture: Research day (250\$)

**2013 NSF** Science visualisation challenge: People's choice and mention from jury.

**2012 UdeS** Student work recognition: Travel award (750\$)

**2012 UdeS** Travel award: Sherbrooke Neuroscience Center (500\$)

**2012 Neuro-bureau** Brain-Art Competition: Winner of Educational Gallery.

## Computer science expertise

**Languages:** C/C++, Python, OpenGL, GLSL, CUDA, ITK/VTK, Java, HTML, CSS,  $\text{\LaTeX}$ , SPARC

**IDE tools:** Microsoft Visual Studio, Eclipse, CMake, Git, SVN

**Softwares:** Fibernavigator, Dipy, MRtrix, Slicer, MITK, FSL, ExploreDTI, Brainvisa/Anatomist, AFNI, ANTs, Freesurfer, MisterI, Matlab, Maple, Scilab, Camtasia, Unity3D (Game engine)

**OS:** Windows, Linux(Ubuntu, CentOS, Mint)

## Projects

**Fibernavigator (Programmer):** Open-source tool for visualization of dMRI and fMRI data. C++, OpenGL, GLSL. [github.com/chamberm/fibernavigator/](https://github.com/chamberm/fibernavigator/)

## Publications

### Journals

- Zhang, Z., M. Descoteaux, J. Zhang, G. Girard, M. Chamberland, D. Dunson, A. Srivastava, and H. Zhu., Mapping Population-based Structural Connectomes., *NeuroImage*, 172 (May): 130-145, 2018.
- Maier-Hein, Klaus H., Peter F. Neher, Jean-Christophe Houde, Marc-Alexandre Côté, Eleftherios Garyfallidis, Jidan Zhong, Maxime Chamberland et al., The challenge of mapping the human connectome based on diffusion tractography., *Nature communications* 8, no. 1 (2017): 1349
- **Chamberland M.**, Girard G., Bernier M., Fortin D., Descoteaux M., Whittingstall K., On the origin of individual functional connectivity variability: The role of white matter architecture, *Brain Connectivity* 2017.
- **Chamberland M.**, Scherrer B., Prabhu S., Madsen J., Whittingstall K., Fortin D., Descoteaux M., Warfield S.K., Improved delineation of Meyer's loop using oriented priors through MAGNETic Tractography (MAGNET), *Human Brain Mapping* 2016.
- C.M.W. Tax, M. Chamberland, M. van Stralen, M.A. Viergever, K. Whittingstall, D. Fortin, M. Descoteaux, A. Leemans, Seeing more by showing less: Orientation-dependent transparency rendering for fiber tractography visualization, *PLoS One* 2015.

- **Chamberland M.**, Bernier M., Fortin D., Whittingstall K., Descoteaux M., 3D interactive tractography-informed resting-state fMRI connectivity, *Frontiers in Neuroscience* 2015.
- **Chamberland M.\***, Bernier M.\*, Houde JC., 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 Human Neuroscience* 2014.
- **Chamberland M.**, Fortin D., Mathieu D., Descoteaux M., Real-time HARDI tractography for instantaneous structural connectivity display, *Frontiers in Neuroinformatics* 2014.
- Coupé P., Manjon J., Chamberland M., Descoteaux M., Hiba B. Collaborative Patch-Based Super-Resolution for Diffusion-Weighted Images, *NeuroImage* 2013.

#### Conference proceedings

- **Chamberland M.**, Graw W., Descoteaux M., Jones D.K., Interactive Computation and Visualization of Structural Connectomes in Real-Time, *MICCAI CNI Workshop*, September 2017.
- Girard G., Chamberland M., Houde J-C, Fortin D., Descoteaux M. Neurosurgical tracking at the Sherbrooke Connectivity Imaging Lab (SCIL), *MICCAI DTI-Challenge*, July 2012.

#### Book chapters

- Vaillancourt O., Chamberland M., Houde J-C., Descoteaux M., Visualization of Diffusion Propagator and Multiple Parameter Diffusion Signal, *Visualization and Processing of Tensors and Higher Order Descriptors for Multi-Valued Data*, Springer, 2015

#### Abstracts

- **Chamberland M.**, Derek K. Jones, "Enhancing bundle topology for tractography visualization using silhouette rendering", Proceeding of: International Society of Magnetic Resonance in Medicine (ISMRM), Paris, June 2018
- **Chamberland M.**, Descoteaux M., Derek K. Jones, "Advances in structural and functional connectivity visualization using the Fibernavigator", Proceeding of: International Society of Magnetic Resonance in Medicine (ISMRM), Paris, June 2018
- **Chamberland M.**, Tax M.W.C, Gray W., Derek K. Jones, "The neurosurgical implication of scanner, gradient performance and acquisition protocol on Meyer's loop reconstruction", Proceeding of: International Society of Magnetic Resonance in Medicine (ISMRM), Paris, June 2018
- **Chamberland M.**, Tax, C.M.W., Fortin D., Whittingstall K., Descoteaux M. Exploring geometrical sheet-like structures in real-time, , Lisbon, Portuga *In International Symposium on Magnetic Resonance in Medicine - Breaking the barriers of dMRI Workshop*, Lisbon, Portugal, 2016.
- **Chamberland M.**, Girard G., Bernier M., Fortin D., Descoteaux M., Whittingstall K. Reduced structural and functional inter-subject variability in the visuo-motor system *Proceedings of OHBM 2015*, Geneva, Switzerland, 2016.
- **Chamberland M.**, Scherrer B., Prabhu S., Madsen J., Whittingstall K., Fortin D., Descoteaux M., Warfield S.K. Magnetic ROIs enable improved tractography accuracy through oriented prior, *ISMRM*, Singapore 2016.
- **Chamberland M.**, Girard G., Bernier M., Fortin D., Descoteaux M., Whittingstall K. Association between structural and functional inter-subject variability of the motor and visual networks, *ISMRM*, Singapore 2016.
- Paquette, M., Girard G., Chamberland, M., Descoteaux, M., Noise in Diffusion Tractography Connectomes Is Not Additive, *ISMRM*, Singapore 2016.
- **Chamberland M.**, Bernier M., Fortin D., Descoteaux M., Whittingstall K. Tractography-driven resting-state fMRI for investigating inter-subject variability, *Proceedings of OHBM 2015*, Honolulu, Hawaii, 2015.
- **Chamberland M.**, Bernier M., Fortin D., Whittingstall K., Descoteaux M. Interactively computing and visualizing functional and structural brain connectivity in real-time, *ISMRM*, Toronto 2015.

- Bernier M., Chamberland M., Cunnane S., Whittingstall K., Subcortical structures in resting state fMRI: uncovering functional networks involving deep-brain structures using non-local means denoising at 1.5T, *ISMRM*, Toronto 2015.
- **Chamberland M.**, Descoteaux M., Whittingstall K., Fortin D. Simultaneously probing functional and structural brain connectivity in real-time: Fibernavigator: An interactive tool for brain visualization, *Neurotechnix*, Rome, Italy 2014.
- **Chamberland M.**, Bernier M., Fortin D., Descoteaux M., Whittingstall K. Uncovering a visuospatial network at rest, *Proceedings of OHBM 2014*, Hamburg, Germany, 2014.
- **Chamberland M.**, and Descoteaux M. Explore the brain white matter networks in real-time: Multi-sticks fiber tracking, *Proceeding of: International Society of Magnetic Resonance in Medicine (ISMRM)*. Salt Lake City, U.S, 2013.
- **Chamberland M.**, Fortin D., Descoteaux M. Real-Time Fiber Tractography: Interactive Parameter Tuning for Neurosurgical Interventions, In *Proceedings of OHBM 2012*, Beijing, China, June 2012.

#### Thesis

- **Chamberland M.**, Développement d'outils neuroinformatiques spécialisés pour améliorer l'analyse individuelle en médecine personnalisée, Ph.D thesis, 2017.
- **Chamberland M.**, Visualisation en imagerie par résonance magnétique de diffusion: Tractographie en temps réel des fibres de la matière blanche du cerveau, M.Sc. thesis, 2013.

#### Interests

Scientific visualisation, Medical imaging, Snowboard, Hockey.