Maxime Chamberland, PhD

Email: ChamberlandM@cardiff.ac.uk
Website: chamberm.github.io

Language: French (native), English
Nationality: Canadian

Academic History

2017-2019 ***Post-doctoral Research Fellow***
Topic: Computational neuroimaging in diffusion MRI
Cardiff University Brain Research Imaging Centre (CUBRIC), United Kingdom

2013-2017 ***PhD in Radiation Sciences & Biomedical Imaging***
Topic: Diffusion and functional MRI visualisation for neurosurgical planning
Faculty of Medicine and Health Sciences, University of Sherbrooke, Canada

2011-2013 ***MSc in Computer Science and Medical Imaging***
Topic: Real-time fiber tractography using diffusion MRI
Faculty of Science, University of Sherbrooke, Canada

2007-2010 ***BSc in Digital Imaging Science***
Including internships at the Canadian Space Agency (3x).
Faculty of Science, University of Sherbrooke, Canada

Employment History

Fall 2014 ***Sessional Lecturer/Teaching Fellow***
Course: Visual and digital interactions (IMN638), 3h/week.
University of Sherbrooke, Canada

2011-2014 ***Graduate Teaching assistant***
Course: Digital Media Acquisition (IMN117), 1h/week.
University of Sherbrooke, Canada

2008-2009 ***R&D Developer*** *(3x cooperative internships)*
Canadian Space Agency
Desc.: Large-scale Website Redesign (HTML, CSS, C#).
St-Hubert, Québec, Canada

Research Funding

2017-2019 ***Postdoctoral Fellowship*** ($90,000 - ranked 1st across Canada)
Natural Sciences and Engineering Research Council of Canada (NSERC)

2014-2017 ***Alexander-Graham-Bell Graduate Scholarship*** ($105,000)
Natural Sciences and Engineering Research Council of Canada (NSERC)

2014-2016 ***Doctoral scholarship*** (awarded but had to gratefully decline - $40,000)
Fonds de recherche du Québec – Nature et technologies (FRQNT)

2013 ***Graduate scholarship*** ($19,000)
Faculty of Medicine and Health Sciences, University of Sherbrooke, Canada

Training Abroad Grants

Fall 2016 ***Research Travel grant*** ($4000) – led to abstract [22]
Cardiff University Brain Research Imaging Centre (CUBRIC), United Kingdom
Quebec Bio-Imaging Network (QBIN)

Fall 2015 ***Michael Smith Foreign Study Supplement*** ($6,000) – led to publication [5]
Harvard Medical School, Computational Radiology Laboratory
Natural Sciences and Engineering Research Council of Canada (NSERC)

Other prizes

2018 Guarantors of Brain Conference Travel Grant (£600)
2018, 2015-16 ISMRM Conference Educational Stipend ($500)
2017, 2015 Sherbrooke Neuroscience Center Publication Award ($500)
2016-15, 2012 Sherbrooke Neuroscience Center Travel Award ($500)
2016 FRQNT - Publication Award – Chercheurs Étoiles ($1,000)
2015-14 QBIN Travel Award ($500)
2014 Sherbrooke Neuroscience Center Scientific Day ($500)
2014 Neurotechnix – Best Student Paper Award
2013 Molecular Imaging Center of Sherbrooke – Best Student Poster ($300)
2013 ACFAS – Best Scientific Picture ($1,500)
2012 National Science Foundation – Scientific Visualization Challenge
2012 NeuroBureau – Educational Brain Art Competition
2012 University of Sherbrooke – Student Recognition Travel Award ($750)

Invited Talks

Fall 2017 Computational Brain Connectivity Mapping Winter School Workshop
"Interactive & advanced tractography visualization"
Prof. Rachid Deriche, Juans-Les-Pins, France

Fall 2015 Center for Brain Imaging, New York University
"Tractography and surgical planning"
Prof. Fernando Boada, New York, USA

Spring 2015 Department of Mathematics and Computer Science, Tue
"Fibernavigator demo"
Prof. Luc Florack, Eindhoven, Netherlands

Spring 2015 Image Sciences Institute, PROVIDIlab, UMC Utrecht
"Explore brain connectivity in real-time"
Prof. Alexander Leemans, Utrecht, Netherlands

Fall 2014 INRIA Research Institute
"Diffusion & Functional MRI visualization"
Prof. Rachid Deriche, Sophia-Antipolis, France

Spring 2013 Laboratory of Mathematics in Imaging, Harvard Medical School
"Real-time fiber tractography"
Prof. Carl-Fredrik Westin, Boston, USA

Spring 2013 Computational Radiology Laboratory, Harvard Medical School
"Real-time fiber tractography"
Prof. Simon K. Warfield, Boston, USA

Reviewing Expertise
NeuroImage, NeuroImage: Clinical, Human Brain Mapping, Medical Image Analysis, MICCAI2015, Frontiers, PLoS One, Behavioral and Brain Functions, The Open-Neuroimaging Journal, Journal of Neural Systems

List of Publications

a) Journal Papers: Refereed

[1] Chamberland, M., Tax, CMW., and Jones, DK.
"Meyer's loop tractography for image-guided surgery depends on imaging protocol and hardware." **NeuroImage**: Clinical (2018): 458-465.

[2] Zhengwu, Z., Descoteaux, M., Zhang, J., Girard, G., Chamberland, M., Dunson, D., Srivastava, A., and Zhu, H. "Mapping population-based structural connectomes." **NeuroImage** 172 (2018): 130-145.

[3] Maier-Hein, KH., Neher, PF., Houde, J-C., Côté, M-A., Garyfallidis, E., Zhong, J., Chamberland M., et al. "The challenge of mapping the human connectome based on diffusion tractography."
Nature communications 8, no. 1 (2017): 1349.

[4] Chamberland, M., Girard, G., Bernier, M., Fortin, D., Descoteaux, M., and Whittingstall, K. "On the Origin of Individual Functional Connectivity Variability:
The Role of White Matter Architecture."
Brain connectivity 7, no. 8 (2017): 491-503.

[5] Chamberland, M., Scherrer, B., Prabhu, SP., Madsen, J., Fortin, D., Whittingstall, K., Descoteaux, M., and Warfield, SK. "Active delineation of Meyer's loop using oriented priors through MAGNEtic tractography (MAGNET)."
Human brain mapping 38, no. 1 (2017): 509-527.

[6] Kaye, H. L., Peters, J. M., Gersner, R., Chamberland, M., Sansevere, A., and Rotenberg, A. "Neurophysiological evidence of preserved connectivity in tuber tissue."
Epilepsy & behavior case reports 7 (2017): 64-68.

[7] Tax, CMW., Chamberland, M., van Stralen, M., Viergever, MA., Whittingstall, K., Fortin, D., Descoteaux, M., and Leemans, A. "Seeing more by showing less:
Orientation-dependent transparency rendering for fiber tractography visualization."
PloS one 10, no. 10 (2015): e0139434.

[8] Chamberland, M., Bernier M., Fortin, D., Whittingstall, K., and Descoteaux, M.
"3D interactive tractography-informed resting-state fMRI connectivity."
Frontiers in neuroscience 9 (2015): 275.

[9] Vaillancourt, O., Chamberland, M., Houde, J-C., and Descoteaux, M.
"Visualization of diffusion propagator and multiple parameter diffusion signal." Vis. and Proc. of Higher Order Descriptors for Multi-Valued Data, pp. 191-212. Springer, Cham, 2015.

[10] Chamberland, M., Bernier, M., Houde, J-C., Descoteaux, M., and 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 8 (2014): 715.

[11] Chamberland, M., Whittingstall, K., Fortin, D., Mathieu, D., and Descoteaux, M. "Real-time multi-peak tractography for instantaneous connectivity display." Frontiers in neuroinformatics 8 (2014): 59.

[12] Coupé, P., Manjón, JV., Chamberland, M., Descoteaux, M., and Hiba, B. "Collaborative patch-based super-resolution for diffusion-weighted images." **NeuroImage** 83 (2013): 245-261.

[13] Schilling, K. G., Nath, V., Hansen, C., Parvathaneni, P., Blaber, J., Gao, Y., ... & Schiavi, S. (2019). Limits to anatomical accuracy of diffusion tractography using modern approaches. **NeuroImage**, 185, 1-11.

b) Journal Papers: Not Refereed

[14] St-Jean, S., Chamberland, M., Viergever, M. A., & Leemans, A. (2019). Reducing variability in along-tract analysis with diffusion profile realignment. *arXiv preprint arXiv:1902.01399*.

[15] Klaus, Peter Neher, Jean-Christophe Houde, Marc-Alexandre Cote, Eleftherios Garyfallidis, Jidan Zhong, Maxime Chamberland et al. "Tractography-based connectomes are dominated by false-positive connections." bioRxiv (2016): 084137.

c) Conference Papers: Refereed

[16] Chamberland M, Iqbal NS, Rudrapatna SU, Parker G, Tax CMW, Staffurth J, Powell J, Wise RG, Jones D.K (2019) "Characterising tissue heterogeneity in cerebral metastases using multi-shell multi-tissue constrained spherical deconvolution." International Society for Magnetic Resonance in Medicine (**ISMRM19**), Montreal.

[17] Chamberland M, Raven E, Genc S, Duffy K, Parker G, Tax CMW, Descoteaux M, Jones DK. (2019) "Metrics that Matter: Improved statistical power to detect differences in tissue microstructure through dimensionality reduction." International Society for Magnetic Resonance in Medicine (**ISMRM19**), Montreal

[18] *Chamberland, M., and Jones, DK. (2018) "Enhancing bundle topology for tractography visualization using silhouette rendering" In International Symposium on Magnetic Resonance in Medicine (**ISMRM18**), Paris.

[19] *Chamberland, M., Descoteaux, D., Jones DK. (2018) "Advances in structural and functional connectivity visualization using the FiberNavigator" International Symposium on Magnetic Resonance in Medicine (**ISMRM18**), Paris.

[20] *Chamberland, M., Tax, CMW., Gray, W., Jones, DK. (2018) "The neurosurgical implication of scanner, gradient performance and acquisition protocol on Meyer's loop reconstruction" International Symposium on Magnetic Resonance in Medicine (**ISMRM18**), Paris.

[21] *Chamberland, Maxime, Chantal MW Tax, and Derek K. Jones. (2018) "Obtaining representative core streamlines for white matter tractometry of the human brain**.**" In International Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI18**) Computational Diffusion MRI Workshop, 2018.

[22] *Chamberland, M., Gray, W., Descoteaux, M., and Jones, DK. (2017)
"Interactive Computation and Visualization of Structural Connectomes in Real-Time."
In International Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI17**)-CNI Workshop, pp. 35-41. Springer, Cham.

[23] *Chamberland, M., Tax, C.M.W., Fortin, D., Whittingstall, K., Descoteaux, M. (2016) "Exploring geometrical sheet-like structures in real time", International Symposium on Magnetic Resonance in Medicine (**ISMRM16**) – Breaking the barriers of dMRI Workshop, Lisbon, Portugal.

[24] *Chamberland, M., Girard, G., Bernier, M., Fortin, D., Descoteaux, M., Whittingstall, K. (2016) "Reduced structural and functional inter-subject variability in the visuo-motor system", Organization for Human Brain Mapping (**OHBM16**), Geneva, Switzerland.

[25] *Chamberland, M., Scherrer, B., Prabhu, S., Fortin, D., Whittingstall, K., Descoteaux, D. and Warfield, S.K. (2016). "Magnetic ROIs enable improved tractography accuracy through oriented prior", International Symposium on Magnetic Resonance in Medicine (**ISMRM16**), Singapore.

[26] *Chamberland, M., Girard, G., Bernier, M., Fortin, D., Descoteaux, M., and Whittingstall, K. (2016) "Association between structural and functional inter-subject variability of the motor and visual networks", International Symposium on Magnetic Resonance in Medicine (**ISMRM16**), Singapore.

[27] *Chamberland, M., Bernier, M., Fortin, D., Descoteaux, M., and Whittingstall, K. (2015) "Tractography-driven resting-state fMRI for investigating inter-subject variability", Organization for Human Brain Mapping (**OHBM15**), Honolulu, Hawaii.

[28] *Chamberland, M., Bernier, M., Fortin, D., Whittingstall, K., and Descoteaux, M. (2015) "Interactively computing and visualizing functional and structural brain connectivity in real time", International Symposium on Magnetic Resonance in Medicine (**ISMRM15**), Toronto, Canada.

[29] *Chamberland, M., Descoteaux, M., Whittingstall, K., and Fortin, D. (2014)
"Simultaneously probing functional and structural brain connectivity in real time: Fibernavigator: An interactive tool for brain visualization", Neurotechnix, Rome, Italy.

[30] *Chamberland, M., Bernier, M., Fortin, D., Descoteaux, M., and Whittingstall, K. (2014) "Uncovering a visuospatial network at rest", Organization for Human Brain Mapping (**OHBM14**), Hamburg, Germany.

[31] *Chamberland, M., and Descoteaux, M. (2013)
"Explore the brain white matter networks in real time: Multi-sticks fiber tracking", International Symposium on Magnetic Resonance in Medicine (**ISMRM13**), Salt-Lake City, USA.

[32] *Chamberland, M., Fortin, D., and Descoteaux, M. (2012)
"Real-time fiber tractography: Interactive parameter tuning for neurosurgical interventions", Organization for Human Brain Mapping (**OHBM12**), Beijing, China.

[33] Girard, G., M. Chamberland, J. C. Houde, D. Fortin, and M. Descoteaux. (2012)
"Neurosurgical tracking at the Sherbrooke Connectivity Imaging Lab (SCIL)".
In International Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI12**)-DTI Challenge Workshop, pp. 55-73. 2012.