

Maxime Chamberland

ASSISTANT PROFESSOR IN DATA VISUALIZATION

Eindhoven University of Technology, The Netherlands

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Interests: Medical Image Analysis, Data Visualisation, Data Science, Machine Learning

Academic Experience

Assistant professor in Data Visualization - Tenure-track

EINDHOVEN UNIVERSITY OF TECHNOLOGY (TU/E)

- Department of Mathematics & Computer Science

Eindhoven, Netherlands

2023-PRESENT

Radboud University Excellence Initiative Fellowship

DONDERS INSTITUTE FOR BRAIN, COGNITION AND BEHAVIOUR

- Computational Neuroimaging & Clinical Applications
- Supervisor: Prof. D.G. Norris

Nijmegen, Netherlands

2021-2022

Post-Doctoral Research Fellow

CARDIFF UNIVERSITY BRAIN RESEARCH IMAGING CENTRE

- Computational Diffusion MRI & Medical Image Analysis
- Supervisor: Prof. D.K. Jones

Cardiff, United Kingdom

2017-2021

Education

PhD. in Radiation Sciences & Biomedical Imaging

UNIVERSITY OF SHERBROOKE - FACULTY OF MEDICINE AND HEALTH SCIENCES

- Topic: Diffusion and functional MRI visualisation for neurosurgical planning
- Supervisor: Prof. M. Descoteaux

Sherbrooke, Canada

2013-2017

MSc. in Computer Science & Medical Imaging

UNIVERSITY OF SHERBROOKE - COMPUTER SCIENCE FACULTY

- Topic: Real-time fibre tractography and diffusion MRI analysis
- Supervisor: Prof. M. Descoteaux

Sherbrooke, Canada

2011-2013

BSc. in Digital Imaging Science

UNIVERSITY OF SHERBROOKE - COMPUTER SCIENCE FACULTY

- Including 3 internships at the Canadian Space Agency (Junior R&D developer)

Sherbrooke, Canada

2007-2010

Teaching

MRI for the Brain - Diffusion tractography (5XSM0)

EINDHOVEN UNIVERSITY OF TECHNOLOGY (TU/E)

- Department of Electrical Engineering

Eindhoven, Netherlands

Fall 2023

Computer Graphics (volume rendering) (2IV60)

EINDHOVEN UNIVERSITY OF TECHNOLOGY (TU/E)

- Department of Mathematics & Computer Science

Eindhoven, Netherlands

Fall 2023

Seminar Visualization (2IMV00)

EINDHOVEN UNIVERSITY OF TECHNOLOGY (TU/E)

- Department of Mathematics & Computer Science

Eindhoven, Netherlands

Fall 2023

Visual Computing Project (2IMV10)

EINDHOVEN UNIVERSITY OF TECHNOLOGY (TU/E)

- Department of Mathematics & Computer Science

Eindhoven, Netherlands

2023, 2024

Sessional Lecturer

UNIVERSITY OF SHERBROOKE

- Visual and Digital Interactions (IMN638, Real-time rendering & GPU programming)

Sherbrooke, Canada

Fall 2013

Teaching Assistant

UNIVERSITY OF SHERBROOKE

- Digital Medias Acquisition (IMN117, Image analysis)

Sherbrooke, Canada

2011-2013

Research Funding

Open Competition Domain Science M

DUTCH RESEARCH COUNCIL (NWO)

Eindhoven University of Technology

€350,000

2024

Key enabling technologies for minimally invasive interventions in healthcare

DUTCH RESEARCH COUNCIL (NWO)

Eindhoven University of Technology (co-applicant with Prof. Luc Florack)

€1.2M

2023

Radboud Excellence Initiative Fellowship

RADBOUD UNIVERSITY

Donders Institute for Brain, Cognition and Behavior

eq. to €175,000

2021-2023

Postdoctoral Fellowship

NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL OF CANADA (NSERC)

- Ranked 1st across the Biomedical category.

\$90,000

2017-2019

Alexander-Graham-Bell Post-graduate Scholarship

NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL OF CANADA (NSERC)

- High-caliber biomedical PhD fellowship.

\$105,000

2014-2017

Doctoral Fellowship

FONDS DE RECHERCHE DU QUÉBEC - NATURE AND TECHNOLOGY (FRQNT)

- Awarded but gratefully declined in favor of the above grant.

\$40,000

2014-2016

Post-graduate scholarship

FACULTY OF MEDICINE AND HEALTH SCIENCES, UNIVERSITY OF SHERBROOKE (CANADA)

\$19,000

2013

Honors & Awards

TRAINING ABROAD GRANTS

2016 **\$4000**, Quebec Bio-Imaging Network Research Travel Grant - Cardiff University

Cardiff, UK

2015 **\$6000**, Michael Smith Foreign Study Supplement (NSERC) - Harvard Medical School

Boston, USA

TRAVEL STIPENDS

2020 **£165**, Guarantors of Brain Conference Travel Grant

United Kingdom

2018 **£600**, Guarantors of Brain Conference Travel Grant

United Kingdom

2018 **\$500**, ISMRM Conference Educational Stipend

France

2016 **\$500**, ISMRM Conference Educational Stipend

Singapore

2016 **\$500**, Sherbrooke Neuroscience Center Travel Award

Singapore

2015 **\$500**, ISMRM Conference Educational Stipend

Canada

2015 **\$500**, Sherbrooke Neuroscience Center Travel Award

Hawaii

2015 **\$500**, Québec BioImaging Network Travel Award

Hawaii

2014 **\$500**, Québec BioImaging Network Travel Award

Germany

2012 **\$500**, Sherbrooke Neuroscience Center Travel Award

China

2012 **\$750**, University of Sherbrooke – Student Recognition Travel Award

China

PUBLICATIONS AWARDS

2017 **\$500**, Sherbrooke Neuroscience Center Publication Award (also awarded in 2015)

Canada

2016 **\$1000**, FRQNT Chercheurs Étoiles - Best Paper (Nature & Technology)

Canada

2014 **N/A**, Neurotechnix – Best Student Paper Award

Italy

OTHERS

2020	\$200 , ISMRM Pediatric Study Group - Oral presentation	Virtual
2014	\$500 , Sherbrooke Neuroscience Center Scientific Day - Best Oral Presentation	Canada
2013	\$300 , Molecular Imaging Center of Sherbrooke – Best Student Poster	Canada
2013	\$1500 , ACFAS – Best Scientific Picture (Jury’s and people’s choice)	Canada
2012	N/A , National Science Foundation – Scientific Visualization Challenge (People’s choice)	USA
2012	N/A , NeuroBureau – Best Educational Brain Art Illustration	-

Oral Presentations

ISMRM Workshop Diffusion MRI: From Research to Clinic

Amsterdam, Netherlands

POWER-PITCH: TRACTOGRAPHY SESSION

Fall 2022

- Visualization of Superficial Association Fiber Tractography

ISMRM Workshop Diffusion MRI: From Research to Clinic

Amsterdam, Netherlands

POWER-PITCH: TRACTOGRAPHY SESSION

Fall 2022

- Visualizing Fiber ODFs Glyphs Beyond the Plane

MIML 2022

MICROSTRUCTURE IMAGING MEETS MACHINE LEARNING

London, UK

Spring 2022

- Detecting microstructural deviations in individuals with deep diffusion MRI tractometry

OHBM 2022

EDUCATIONAL COURSE: TRACTOMETRY: PEERING INTO THE WHITE MATTER

Virtual

Summer 2022

- Detecting microstructural deviations in individuals with deep diffusion MRI tractometry

OHBM 2021

EDUCATIONAL COURSE: TRACTOMETRY: PEERING INTO THE WHITE MATTER

Virtual

Summer 2021

- Single-subject analysis via high-dimensional analysis

Donders Toolkit 2021-2022

EDUCATIONAL COURSE: BASICS OF DIFFUSION MRI (MSc, PhD)

Virtual

2021

- Basics of Diffusion Imaging and Structural Connectivity

Jena University Hospital seminar series- Germany

INVITED BY DR. DANIEL GULLMAR

Virtual

May 2021

- Tract-specific MRI measures explain learning and recall differences in multiple sclerosis.

MICCAI 2020

ORAL PRESENTATION: COMPUTATIONAL DIFFUSION MRI

Virtual

Fall 2020

- Beyond lesion-load: Tractometry-based metrics

ISMRM 28th Annual Meeting

ORAL PRESENTATION: PEDIATRIC HIGH-END

Virtual

Fall 2020

- Highlighting tract-specific microstructural abnormalities in single subjects using autoencoders

ISMRM 27th Annual Meeting

ORAL PRESENTATION: FIBER ORIENTATIONS & TRACTOGRAPHY SESSION

Montreal, Canada

Spring 2019

- Dimensionality reduction of diffusion MRI measures

Computational Brain Connectivity Mapping Winter School Workshop

INVITED BY PROF. RACHID DERICHE

Juans-Les-Pins, France

Fall 2017

- Interactive & Advanced Tractography Visualization

ISMRM Workshop on Breaking the Barriers of Diffusion MRI

POWER-PITCH: TRACTOGRAPHY SESSION

Lisbon, Portugal

Fall 2016

- Exploring Geometrical Sheet-Like Structures in Real-Time

Center for Brain Imaging, NYU

INVITED BY PROF. FERNANDO BOADA

New York, USA

Fall 2015

- Invited talk on Tractography and Neurosurgical planning

Department of Mathematics and Computer Science, TU/e

INVITED BY PROF. LUC FLORACK

Eindhoven, The Netherlands

Spring 2015

- Invited FiberNavigator demonstration

Image Sciences Institute, PROVIDIlab, UMC

INVITED BY PROF. ALEXANDER LEEMANS

- Invited talk on Exploring brain connectivity in real-time

Utrecht, The Netherlands

Spring 2015

INRIA Research Institute

INVITED BY PROF. RACHID DERICHE

- Invited talk on Diffusion & Functional MRI visualization

Sophia-Antipolis, France

Fall 2014

Laboratory of Mathematics in Imaging, Harvard Medical School

INVITED BY PROF. CARL-FREDRIK WESTIN

- Invited talk on Real-time Fiber Tractography

Boston, USA

Spring 2013

Computational Radiology Laboratory, Harvard Medical School

INVITED BY PROF. SIMON K. WARFIELD

- Invited talk on Real-time Fiber Tractography

Boston, USA

Spring 2013

Supervision

PHD STUDENTS

PhD **2023-**, Tom Hendriks, Eindhoven University of Technology

PhD **2024-**, Ruben Vink, Eindhoven University of Technology

MASTER STUDENTS

MSc **2023-**, Adil Jahouh, Eindhoven University of Technology

MSc **2023-**, Teodor Lungu, Eindhoven University of Technology

MSc **2023-**, Paul Zelina, Eindhoven University of Technology

MSc **2023-**, Mattijs Jansen, Eindhoven University of Technology

MSc **2023-**, Miriam Laamoumi, Eindhoven University of Technology

MSc **2023-**, Tudor Voicu, Eindhoven University of Technology

MSc **2023**, Cas Sievers, Eindhoven University of Technology

MSc **2022-2023**, Tonia Schouten, Donders Center for Cognitive Neuroimaging

MSc **2022-2023**, Nienke Gerards, Donders Center for Cognitive Neuroimaging

MSc **2019-2020**, Peter Murkin, Cardiff University Brain Research Imaging Centre

MSc **2018-2019**, Kate Duffy, Cardiff University Brain Research Imaging Centre

Service

BOARD MEMBER

2020- **NSERC**, Natural Sciences and Engineering Research Council of Canada, Biomedical

2022 Scholarships (PhD) and Fellowships (Post-doctoral) Selection Committee

Canada

MODERATOR

2019 **Chair moderator**, Multi-Scale Imaging of the White Matter Neuroanatomy workshop

*Montreal,
Canada*

ORGANISING COMMITTEE

2024 **Board member**, Computational Diffusion MRI Workshop

*Marrakesh,
Morocco*

REVIEWER Nature Communications, Neuroimage, Neuroimage Clinical, Human Brain Mapping, Medical Image Analysis, Brain Structure and Function, Frontiers, Aperture, PLOS One, PLOS Computational Biology, MICCAI, cdMRI workshop, International Journal of Stroke, MAGMA, MRM, IEEE VIS 2020 SciVis, Computer Graphics Forum, IEEE TMI, Scientific Reports, Neurocomputing, Cell, Nature Digital Medicine

Publications

JOURNAL PAPERS

1. Schilling, Kurt G., Jordan A. Chad, **Maxime Chamberland**, Victor Nozais, Francois Rheault, Derek Archer, Muwei Li et al. "White matter tract microstructure, macrostructure, and associated cortical gray matter morphology across the lifespan." *Imaging Neuroscience* (2023).
2. Li, H., Jacob, M.A., Cai, M., Duering, **M., Chamberland**, M., Norris, D.G., Kessels, R.P., de Leeuw, F.E., Marques, J.P. and Tuladhar, A.M., 2023. Regional cortical thinning, demyelination, and iron loss in cerebral small vessel disease. *Brain*, p.awad220.
3. Li, Hao, Mengfei Cai, Mina A. Jacob, David G. Norris, José P. Marques, **Maxime Chamberland**, Marco Duering, Roy PC Kessels, Frank-Erik de Leeuw, and Anil M. Tuladhar. "Dissociable contributions of thalamic-subregions to cognitive impairment in small vessel disease." *Stroke* (2023).
4. Chan KS, **Chamberland M**, Marques JP. On the performance of multi-compartment relaxometry for myelin water imaging (MCR-MWI)–test-retest repeatability and inter-protocol reproducibility. *NeuroImage*. 2023 Feb 1;266:119824.
5. Shastin, D., Genc, S., Parker, G.D., Koller, K., Tax, C.M., Evans, J., Hamandi, K., Gray, W.P., Jones, D.K. and **Chamberland, M.**, 2022. Surface-based tracking for short association fibre tractography. *NeuroImage*, 260, p.119423.
6. Casella, C., **Chamberland, M.**, Laguna, P.L., Parker, G.D., Rosser, A.E., Coulthard, E., Rickards, H., Berry, S.C., Jones, D.K. and Metzler-Baddeley, C., 2022. Mutation-related magnetization transfer, not axon density, drives white matter differences in premanifest Huntington disease: Evidence from in vivo ultra-strong gradient MRI. *Human Brain Mapping*.
7. Schilling, K.G., Rheault, F., Petit, L., Hansen, C.B., Nath, V., Yeh, F.C., Girard, et al. 2021. *Tractography dissection variability: what happens when 42 groups dissect 14 white matter bundles on the same dataset?*. *NeuroImage*, 243, p.118502.
8. **Chamberland, M.**, Genc, S., Tax, C.M.W., Shastin, D., Koller, K., Raven, E., Cunningham, A., Doherty, J., van den Bree, M., Parker, G., Hamandi, K., Gray, WP., Jones, DK., 2020. *Detecting microstructural deviations in individuals with deep diffusion MRI tractometry*. *Nature Computational Science*, 598-606, 2021.
9. Tax, CMW., Kleban, E., **Chamberland, M.**, Baraković, M., Rudrapatna, U., and Derek K. Jones. "Measuring compartmental T2-orientational dependence in human brain white matter using a tiltable RF coil and diffusion-T2 correlation MRI." *NeuroImage* 236 (2021): 117967.
10. Winter, M., Tallantyre, C E., Brice, AW T., Robertson, P N., Jones, K D., **Chamberland, M.**, Tract-specific MRI measures explain learning and recall differences in multiple sclerosis, *Brain Communications*, 2021;, fcab065.
11. Koller, K., Rudrapatna, U., **Chamberland, M.**, Raven, E. P., Parker, G. D., Tax, C. M., ... and Jones, D. K. (2020). MICRA: Microstructural image compilation with repeated acquisitions. *NeuroImage*, 225, 117406.
12. Barakovic, M., Tax, C.M., Rudrapatna, U.S., **Chamberland, M.**, Rafael-Patino, J., Granziera, C., Thiran, J.P., Daducci, A., Canales-Rodríguez, E.J. and Jones, D.K., 2020. Resolving bundle-specific intra-axonal T2 values within a voxel using diffusion-relaxation tract-based estimation. *NeuroImage*, p.117617.
13. de Almeida Martins, J.P., Tax, C. M. W., Reymbaut, A., Szczepankiewicz, F., **Chamberland, M.**, Jones, D. K., Topgaard, D., 2020. *Computing and visualising intra-voxel orientation-specific relaxation-diffusion features in the human brain*: *Human Brain Mapping*.
14. Geeraert, B., **Chamberland, M.**, Lebel, M., Lebel, C., 2020. *Multimodal principal component analysis to identify major features of white matter structure and links to reading*. *PloS one (in press)*.
15. Genc, S., Tax, C. M., Raven, E. P., **Chamberland, M.**, Parker, G. D., Jones, D. K., 2020. *Impact of b-value on estimates of apparent fibre density*. *Human Brain Mapping*.
16. Rheault, F., De Benedictis, A., Daducci, A., Maffei, C., Tax, C.M.W. et al., 2020. *Tractostorm: The what, why, and how of tractography dissection reproducibility*. *Human Brain Mapping*
17. St-Jean, S., **Chamberland, M.**, Viergever, M.A. and Leemans, A., 2019. *Reducing variability in along-tract analysis with diffusion profile realignment*. *NeuroImage*, 199, 663-679.

18. **Chamberland, M.**, Raven, E.P., Genc, S., Duffy, K., Descoteaux, M., Parker, G.D., Tax, C.M. and Jones, D.K., 2019. *Dimensionality reduction of diffusion MRI measures for improved tractometry of the human brain*. *NeuroImage*, 200, 89-100.
19. Schilling, K.G., Nath, V., Hansen, C., Parvathaneni, P., Blaber, J., Gao, Y., Neher, P., et al., 2019. *Limits to anatomical accuracy of diffusion tractography using modern approaches*. *NeuroImage*, 185, pp.1-11.
20. Zhang, Z., Descoteaux, M., Zhang, J., Girard, G., **Chamberland, M.**, Dunson, D., Srivastava, A. and Zhu, H., 2018. *Mapping population-based structural connectomes*. *NeuroImage*, 172, pp.130-145.
21. **Chamberland, M.**, Tax, C.M. and Jones, D.K., 2018. *Meyer's loop tractography for image-guided surgery depends on imaging protocol and hardware*. *NeuroImage: Clinical*, 20, pp.458-465.
22. Maier-Hein, K.H., Neher, P.F., Houde, J.C., Côté, M.A., Garyfallidis, E., Zhong, J., **Chamberland, M.** et al., 2017. *The challenge of mapping the human connectome based on diffusion tractography*. *Nature communications*, 8(1), p.1349.
23. **Chamberland, M.**, Girard, G., Bernier, M., Fortin, D., Descoteaux, M. and Whittingstall, K., 2017. *On the origin of individual functional connectivity variability: the role of white matter architecture*. *Brain connectivity*, 7(8), pp.491-503.
24. **Chamberland, M.**, Scherrer, B., Prabhu, S.P., Madsen, J., Fortin, D., Whittingstall, K., Descoteaux, M. and Warfield, S.K., 2017. *Active delineation of Meyer's loop using oriented priors through MAGNETic tractography (MAGNET)*. *Human brain mapping*, 38(1), pp.509-527.
25. Kaye, H.L., Peters, J.M., Gersner, R., **Chamberland, M.**, Sansevere, A. and Rotenberg, A., 2017. *Neurophysiological evidence of preserved connectivity in tuber tissue*. *Epilepsy & behavior case reports*, 7, pp.64-68.
26. Tax, C.M., **Chamberland, M.**, van Stralen, M., Viergever, M.A., Whittingstall, K., Fortin, D., Descoteaux, M. and Leemans, A., 2015. *Seeing more by showing less: orientation-dependent transparency rendering for fiber tractography visualization*. *PloS one*, 10(10), p.e0139434.
27. **Chamberland, M.**, Bernier, M., Fortin, D., Whittingstall, K. and Descoteaux, M., 2015. *3D interactive tractography-informed resting-state fMRI connectivity*. *Frontiers in neuroscience*, 9, p.275.
28. **Chamberland, M.**, Bernier, M., Houde, J.C., Descoteaux, M. and Whittingstall, K., 2014. *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, p.715.
29. **Chamberland, M.**, Whittingstall, K., Fortin, D., Mathieu, D. and Descoteaux, M., 2014. *Real-time multi-peak tractography for instantaneous connectivity display*. *Frontiers in neuroinformatics*, 8, p.59.
30. Coupé, P., Manjón, J.V., **Chamberland, M.**, Descoteaux, M. and Hiba, B., 2013. *Collaborative patch-based super-resolution for diffusion-weighted images*. *NeuroImage*, 83, pp.245-261.

SHORT PAPERS

1. **Chamberland, M.**, Genc, S., Raven, E., Parker, G., Tax, C.M.W., Cunningham, A., Doherty, J., van den Bree, M., Jones, D.K., 2020. *Tractometry-based Anomaly Detection for Single-subject White Matter Analysis*. *Proceedings of The 3rd International Conference on Medical Imaging with Deep Learning (MIDL)*, Montreal, 2020.
2. Girard, G., **Chamberland, M.**, Houde, J.C., Fortin, D. and Descoteaux, M., 2012. *Neurosurgical tracking at the sherbrooke connectivity imaging lab (SCIL)*. In *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI'12)-DTI Challenge Workshop* (pp. 55-73).

BOOK CHAPTERS

1. Osman B, Pereira M, van de Wetering H, **Chamberland M.** Voxlines: Streamline Transparency through Voxelization and View-Dependent Line Orders. *MICCAI 2023 - International Workshop on Computational Diffusion MRI*
2. Hendriks T, Villanova A, **Chamberland M.** Neural Spherical Harmonics for structurally coherent continuous representation of diffusion MRI signal. *MICCAI 2023 - International Workshop on Computational Diffusion MRI*
3. **Chamberland, M.**, Winter, M., Brice, T., Jones, D.K., Tallantyre, E., 2020, September. *Beyond lesion-load: Tractometry-based metrics for characterizing white matter lesions within fibre pathways*. *MICCAI 2020 - International Workshop on Computational Diffusion MRI*

4. **Chamberland, M.**, St-Jean, S., Tax, C.M. and Jones, D.K., 2018, September. *Obtaining representative core streamlines for white matter tractometry of the human brain*. In International Conference on Medical Image Computing and Computer-Assisted Intervention (pp. 359-366). Springer, Cham.
5. **Chamberland, M.**, Gray, W., Descoteaux, M. and Jones, D.K., 2017, September. *Interactive Computation and Visualization of Structural Connectomes in Real-Time*. In International Workshop on Connectomics in Neuroimaging (pp. 35-41). Springer, Cham.
6. Vaillancourt, O., **Chamberland, M.**, Houde, J.C. and Descoteaux, M., 2015. *Visualization of diffusion propagator and multiple parameter diffusion signal*. In Visualization and Processing of Higher Order Descriptors for Multi-Valued Data (pp. 191-212). Springer, Cham.

CONFERENCE ABSTRACTS

1. **Chamberland, M.**, Poirier, C., Norris, D.G., Descoteaux, M., 2022. *Visualizing fiber ODFs glyphs beyond the plane*. International Society for Magnetic Resonance in Medicine (ISMRM) – Diffusion MRI: From Research to Clinic, Amsterdam, Netherlands.
2. **Chamberland, M.**, Shastin, D., Jones, D.K., Norris, D.G., 2022. *Visualization of superficial association fiber tractography*. International Society for Magnetic Resonance in Medicine (ISMRM) – Diffusion MRI: From Research to Clinic, Amsterdam, Netherlands.
3. **Chamberland, M.**, Tuladhar, A.M., Dewenter, A., Cai, M., Jacob, M.A., ter Telgte, A., Wiegertjes, K., Zwiers, M., Marques, J.P., Tax, C.M.W., Duering, M., de Leeuw, F-E., Norris, D.G., 2021. *A diffusion MRI tractometry approach in cerebral small vessel disease*. International Society for Magnetic Resonance in Medicine (ISMRM), London, UK.
4. **Chamberland, M.**, Shastin, D., Genc, S., Hamandi, K., Gray, W.P., Tax, C.M.W. Jones, D.K., 2021. *An n=1 approach to white matter anomaly detection in epilepsy*. International Society for Magnetic Resonance in Medicine (ISMRM), Vancouver, Canada.
5. **Chamberland, M.**, Genc, S., Raven, E., Parker, G., Tax, C.M.W., Cunningham, A., Doherty, J., van den Bree, M., Jones, D.K., 2020. *Highlighting tract-specific microstructural abnormalities in single subjects using autoencoders*. International Society for Magnetic Resonance in Medicine (ISMRM), Paris, France.
6. **Chamberland, M.**, Genc, S., Raven, E., Parker, G., Tax, C.M.W., Cunningham, A., Doherty, J., van den Bree, M., Jones, D.K., 2020. *Tract-specific microstructural anomaly detection using autoencoders for single subject analysis*. Organization for Human Brain Mapping (OHBM), Montreal, Canada.
7. **Chamberland, M.**, Iqbal, N.S., Rudrapatna, S.U., Parker, G., Tax, C.M.W., Staffurth, J., Powell, J., Wise, R.G., 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 (ISMRM), Montreal, Canada.
8. **Chamberland, M.**, Raven, E., Genc, S., Duffy, K., Parker, G., Tax, C.M.W., Descoteaux, M., Jones, D.K., 2019. *Metrics that Matter: Improved statistical power to detect differences in tissue microstructure through dimensionality reduction*. International Society for Magnetic Resonance in Medicine (ISMRM), Montreal, Canada.
9. **Chamberland, M.**, and Jones, D.K., 2018. *Enhancing bundle topology for tractography visualization using silhouette rendering*. International Society for Magnetic Resonance in Medicine (ISMRM), Paris, France.
10. **Chamberland, M.**, Descoteaux, D., Jones D.K., 2018. *Advances in structural and functional connectivity visualization using the FiberNavigator*. International Society for Magnetic Resonance in Medicine (ISMRM), Paris, France.
11. **Chamberland, M.**, Tax, C.M.W., Gray, W., Jones, D.K., 2018. *The neurosurgical implication of scanner, gradient performance and acquisition protocol on Meyer's loop reconstruction*. International Society for Magnetic Resonance in Medicine (ISMRM), Paris, France.
12. **Chamberland, M.**, Tax, C.M.W., Fortin, D., Whittingstall, K., Descoteaux, M., 2016. *Exploring geometrical sheet-like structures in real time*. International Society for Magnetic Resonance in Medicine (ISMRM) – Breaking the barriers of diffusion MRI Workshop, Lisbon, Portugal.

13. **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 Society for Magnetic Resonance in Medicine (ISMRM), Singapore.
14. **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 Society for Magnetic Resonance in Medicine (ISMRM), Singapore.
15. **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 (OHBM), Honolulu, Hawaii.
16. **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 Society for Magnetic Resonance in Medicine (ISMRM), Toronto, Canada.
17. **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.
18. **Chamberland, M.**, Bernier, M., Fortin, D., Descoteaux, M., and Whittingstall, K., 2014. *Uncovering a visuospatial network at rest*. Organization for Human Brain Mapping (OHBM), Hamburg, Germany.
19. **Chamberland, M.** and Descoteaux, M., 2013. *Explore the brain white matter networks in real-time: multi-sticks fiber tracking*. International Society for Magnetic Resonance in Medicine (ISMRM), Salt-Lake City, USA.
20. **Chamberland, M.**, Fortin, D. and Descoteaux, M., 2012. *Real-time fiber tractography: interactive parameter tuning for neurosurgical interventions*. Organization for Human brain mapping (OHBM), Beijing, China.

THESES

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

Github Projects

Inter-Tractive

[HTTPS://GITHUB.COM/CIEVERS/INTER-TRACTIVE](https://github.com/cievers/inter-tractive)

- Shape feature visualization

C#

2023

NeuroTrace

[HTTPS://GITLAB.COM/BESM/NEUROTRACE](https://gitlab.com/besm/neurotrace)

- NeuroTrace is a software application capable of reading, interpreting, and visualizing MRI tractography data.

C#, OpenGL, GLSL

2023

Detect

[HTTPS://GITHUB.COM/CHAMBERM/DETECT](https://github.com/chamberm/detect)

- A browser-based anomaly detection framework for diffusion MRI using Tractometry.

Python

2020-2021

Lesionometry

[HTTPS://GITHUB.COM/CHAMBERM/LESIONOMETRY](https://github.com/chamberm/lesionometry)

- Tractometry-based metrics for characterizing white matter lesions within fibre pathways.

Python

2020-2021

FiberNavigator

[HTTPS://GITHUB.COM/CHAMBERM/FIBERNAVIGATOR](https://github.com/chamberm/fibernavigator)

- Open-source neuroimaging visualization tool for diffusion MRI data.

C++, OpenGL, GLSL

Main active developer