Στħαη **MacDonald, PhD, PEng**

Contact Information

Last Updated: November 23, 2020
E-mail: memacdon@ucalgary.ca
Website: ethanmacdonald.ca
Phone (Office): +1 (403) 210 - 5469
Fax (Shared): +1 (403) 210 - 9330

Mail To:
Health Science Building, Room 2910F
University of Calgary, Foothills Campus
3330 Hospital Drive NW
Calgary, Alberta, Canada
T2N 4N1

Current Position: Assistant Professor, Dept. of Electrical and Computer Engineering, University of Calgary

Academic Record

University of Calgary, Calgary, Alberta, Canada

P.D.F., Radiology, 2014 to 2019

- Project: *Magnetic Resonance Imaging of Healthy Brain Aging*
- Advisor: Bruce Pike, PhD
- Summary of Research: MRI Development, Supercomputing and Big Data Applications, Quantitative Functional MRI, Imaging of Brain Aging

Ph.D., Biomedical Engineering, 2010 to 2014

- Thesis: *Quantitative Cerebrovascular Magnetic Resonance Imaging*
- Advisor: Richard Frayne, PhD
- Summary of Research: Examined methods for acquiring angiographic images of the brain, primarily focused on the technical aspects of phase contrast velocity encoding, arterial spin labelling, and flow asymmetry.

M.Sc., Biomedical Engineering, 2008 to 2010

- Thesis: *Passive Catheter Tracking in the Carotid Artery with Accelerated Magnetic Resonance Imaging*
- Advisor: Richard Frayne, PhD
- Summary of Research: Development of real-time infrastructure for visualizing endovascular catheters with MRI. Demonstrated navigation from the femoral to the carotid artery in a canine model.

Lakehead University, Thunder Bay, Ontario, Canada

B.Sc., Electrical Engineering, 2006 to 2008

- Thesis: *A Single Wheel Gyroscopically Stabilized Robot*
- Advisor: Krishnamoorthy Natarajan, PhD
- Subjects Studied: Engineering Mathematics, Circuit Design, Electric Machines, Electromagnetic Physics, Power Systems Analysis, Power Electronics, Robotics, Control Systems, VLSI, Numerical Methods, Digital Signal Processing and Philosophy.

Nova Scotia Community College, Halifax/Kentville, Nova Scotia, Canada

Diploma, Electronic Engineering Technologist, 2005 to 2006

- Technologist program extending from technician diploma at the NSCC
- Additional Subjects: Calculus, Computer Hardware, Computer Programming (C/C++), Data Acquisition Programming, Embedded Controllers and Systems, Quality and Statistics, and Business Management

Diploma, Electronic Engineering Technician, 2003 to 2005

- Technician program focused on electronics design and fabrication
- Instructors: Jim Innis and Ron Gillis
- Subjects Studied: Communications, Electronic Drafting, Analog/Digital Comm, DC/AC Theory, Digital Logic, Fabrication, Computer Hardware and Networking, Semiconductors, Electric Machines, Microcontroller programming, Business, PLC (Programmable Logic Controllers), and Applied Math

Teaching Experience

Biomedical Engineering 415 - Sensor Systems and Data Analytics 2020 to present

Introduction to matrix and tensor manipulation with focus on computer programming aspects. Sensor systems and design of data collection strategies, with examples in relevant areas of biomedical engineering. Data curation and conditioning including outlier and anomaly pattern detection, noise removal and data reduction. Unsupervised clustering and association mining using machine learning techniques. Supervised classification using advanced machine learning techniques. Completion of a sensor- and data-oriented project in the area of biomedical engineering.

Student Supervision and Mentorship 2008 to 2019

- **Branden Wong**, Summer Student, May to August, 2019;
- **Jeffery Hao**, Summer Student, May to August, 2018;
  Engineering Course Project Supervisor, September 2017 to April 2018
- **Micheal Taylor**, Summer Student, May to August, 2018
- **Sarah Scot**, Summer Student, May to August, 2018 & May to Dec 2019
- **Thomas Mosher**, Summer Student, May to August, 2017
- **David Adair**, Summer Student, May to August, 2011
- **Nolan Swailes**, Summer Student, May to August, 2010 & 2012
- **Laura Sevick**, Summer Student, May to August, 2009

Teaching Assistant 2008 to 2014

Department of Radiology, Department of Electrical Engineering,
and the Biomedical Engineering Graduate Program at University of Calgary

- Imaging Theory (MDSC 689.11)
- Advanced Medical Imaging (MDSC 689.01)
- Design and Communications I & II (ENG 251/253)
- Electric Circuit Theory (BMEN 327)
- Numerical Methods (ENG 407)

Program Assistant Summer 2007

Shad Valley

- Aided running the Shad Valley summer camp
- Organized 'Shad Speaks' symposium where participants gave academic talks
- Worked under the supervision of Sultan Siddiqui, PhD

Ski Instructor 2000 to present

Martock/ Loch Lommond/C.O.P.

- Ski Instructor certified through the Canadian Ski Instructors Alliance
- Taught skiing in Windsor, NS; Thunder Bay, ON; and Calgary, AB
- Lead personal development sessions for other instructors to improve pedagogy skills

Work Experience

Research Scientist 2020

At the Hotchkiss Brain Institute under the supervision of Prof. Bruce Pike.

- MRI Development
- Supercomputing and Big Data Applications
- Quantitative Functional MRI

Consultant / Developer 2012 to 2013

QTS Capital Management, LLC

- Development of High Frequency Trading Systems
- Interfacing through Knight Capital and Interactive Brokers
- Supervisor: Ernest P. Chan, PhD — Blog

Research Assistant Summer 2008
University of Calgary, Department of Electrical Engineering
- Investigated deconvolution algorithms for obtaining perfusion measurements
- Worked under the supervision of Michael R. Smith, PhD

Electronics Technician / Research Assistant Summer 2005
Bedford Institute of Oceanography
- Design and fabrication of electronics for oceanographic instruments
- Development of infrared camera system for counting eels during migration
- Worked under the supervision of Brian Beanlands

Volunteer Experience

Ski Patroller 2005 to present
Canadian Ski Patrol
- Patrolled in Scotia, Superior, Kootenay, Southern Alberta, and Calgary Zones
- Trained for emergency medical response in an alpine setting
- Instructor for ski improvement in the Calgary Zone

Kitchen Volunteer & Server 2019 to present
Calgary Drop in & Rehab Centre
- Preparing and serving meals for those in need at the Drop in Centre
- Organizing and working with a new team each time

Fund Raiser 2010 to present
Movember and Heart and Stroke Foundation
- Raising funds for charity
- Raising public awareness through fund raising

Conference Organizing Assistant 2011
Society for Magnetic Resonance Angiography
- Assisted with conference organization
- Lead social and scientific activites
- Worked under the lead conference organizer: Richard Frayne, PhD

Leadership Experience

Mentoring Research Trainees
- Primary advisor for nine summer students
- Played an active role mentoring three masters students
- Always promoted high quality exploratory research

Director of Home Owner Association
- Board Member for association with 220 households
- Managing Operating budget of $1.3 M per year
- Resolving conflicts between residents

Scientific Outreach
- City of Calgary Science Fair Judge 2009&10
- Tours of the MR Centre for High School and Undergraduate students
- Volunteer and tour leader at Discovery Days
- Liaison for Electrical Engineering at University of Calgary Campus Fair

Chief Scout
- Excellence of Citizenship, Leadership, Personal Development, and Outdoor Skills
- Community Service
- Leading Peers in Camping and Hiking Adventures

Skills

Leadership Skills
- Communication - both verbal and written English; significant experience at writing scientific documents and giving oral presentations
- Teaching, Pedagogy, & Mentorship
- Management and Supervision

Computer Skills
- Proficient with Computers - both hardware and software
- Familiar with different operating systems, including: MacOS, Windows and Unix
- Expert use of Microsoft Office Word and Excel
- Programming Experience with: MATLAB, Python, R, C++, C, SQL, FreeNAS, FreeSurfer, FSL, ANTs, TensorFlow, Keras, EPIC (GE MR pulse sequence programming), KSFoundation (Pulse programming abstraction layer) HTML, Latex, Qt, ITK, VTK, OpenFOAM, FIX and IB-API
- Version Control: GIT, SVN, CVS
- Super Computing with SLURM and PBS architectures

Lab Skills
- Running MRI scanners (experience with GE Signa and Discovery models)
- Electronics Fabrication (design and high reliability soldering certificate)
- Large Animal Handling (certified through the Animal Research Committee at the University of Calgary)
- Data Management

Professional Activities

Participated as Peer Reviewer
- Total of eight journal articles: NMR in Biomedicine (2), IJDI (2), Neurosurgery (1), Neuroimage (3), the American Journal of Roentgenology (1), Journal of Magnetic Resonance Imaging (2) and Magnetic Resonance in Medicine (3)
- Reviewed over 150 abstracts for multiple years at ISMRM meeting
- Reviewed over 50 abstracts for multiple years at OHBM meeting
- Reviewed over 200 abstracts submissions for the International MRA Conference
- Named Reviewer for the International Journal of Diagnostic Imaging

Professional Memberships
- Association Professional Engineers, Geoscientists of Alberta (APEGA) Professional Member
- International Society of Magnetic Resonance in Medicine (ISMRM) Trainee Member
- Institute of Electrical and Electronics Engineers (IEEE) Trainee Member
- Organization for Human Brain Mapping Trainee Member
- American Heart Association Trainee Member
- University of Calgary Post Doctoral Association
- University of Calgary Alumni Association
- Lakehead University Alumni Association
- Nova Scotia Community College Alumni Association
- Canadian Ski Patrol (CSP)
- Canadian Ski Instructors Alliance (CSIA) Level 2
- Canadian Ski Coaches Federation (CSCF) Level 1
- Canadian Avalanche Association (CAA) Operations Level 1

Awards and Research Support

2019/01 - 2020/01	CONP Research Scholar Award
2017/04	ISMRM Magna Cum Laude
2016/05	ISMRM Educational Stipend
2015/06	ISMRM Educational Stipend
2014/06/12	Radiology Research Day - Best Presentation by a Researcher
2014/09 - 2016/09	I3T NSERC CREATE PDF
2014/05	ISMRM Educational Stipend
2013/06	NIH Young Investigator Travel Stipend to Society for MRA
2013/05	Canadian Ski Patrol - Appreciation Award
2012/05&09	Biomedical Engineering Graduate Program Travel Award
2012/05	Faculty of Graduate Studies Travel Stipend
2011/09	Society for Magnetic Resonance Angiography Trainee Stipend
2011/09 - 2014/08	T. Chen Fong Doctoral Scholarship
2010/09 - 2014/08	Alberta Innovates - PhD Student Training Program
2010/09 - 2013/04	NSERC - Post Graduate Scholarship
2010/05	Faculty of Graduate Studies Travel Stipend
2010/04	University of Calgary - Diagnostic Imaging Research Award
2010/04 - 2010/08	Queen Elizabeth II Graduate Scholarship
2009/04 - 2010/04	NSERC - Graham Bell Canadian Graduate Scholarship
2009/04 - 2010/04	ICore - Graduate Scholarship in ICT
2008/08 - 2009/04	Queen Elizabeth II Graduate Scholarship
2008/04 - 2009/08	NSERC - Undergraduate Student Research Award
2008/06	Dean Braun Medal, Lakehead University
2008/06	PEO Medal for Academics (Professional Engineers of Ontario)
2006-2008	Lakehead University Award for Academics
1999	Chief Scout Award

Scientific Contributions, Publications and Presentations

Citation analysis can be found at my Google Scholar profile

Peer Reviewed Manuscripts (Published)

14. **M.E. MacDonald**, R.J. Williams; D. Rajashekar, R.B.S. Stafford, A. Hanganu, H. Sun, A.J.L Berman, C.M. McCreary, R. Frayne, N.D. Forkert G.B. Pike. The Effect of Aging on Cerebral Blood Flow and Cortical Thickness with Application to Age Prediction. *Neurobiology of Aging* 2020: 95:131-142 https://doi.org/10.1016/j.neurobiolaging.2020.06.019

13. D. Rajashekar, M. Wilms, **M.E. MacDonald**, J. Ehrhardt, P. Mouches, R. Frayne, M. Hill, N.D. Forkert. High-resolution T2-FLAIR and non-contrast CT brain atlas of the elderly. *Scientific Data* 2020: 7(56): https://doi.org/10.1038/s41597-020-0379-9

12. **M.E. MacDonald**, R.J. Williams, N.D. Forkert, A.J.L. Berman, C.R. McCreary, R. Frayne, G.B. Pike. Interdatabase Variability of Cortical Thickness Measurements. *Cerebral Cortex* 2019; 29(8):3282-3293 https://doi.org/10.1093/cercor/bhy197

11. H. Sun, Y. Ma, **M.E. MacDonald**, G.B. Pike. Whole Head Quantitative Susceptibility Mapping Using a Least-norm Direct Dipole Inversion Method. *Neuroimage* 2018; 179:166-175

10. **M.E. MacDonald**, A.J.L. Berman, R.J. Williams, E.L. Mazerole, G.B. Pike. Modelling Hyperoxia-induced BOLD Signal Dynamics to Estimate Cerebral Blood Flow, Volume and Mean Transit Time. *Neuroimage* 2018; 178:461-474

9. A.J.L. Berman, E.L. Mazerolle, **M.E. MacDonald**, N.P. Blockley, W. Luh, G.B. Pike. Gas-free Calibrated fMRI with a Correction for Vessel-Size Sensitivity. *NeuroImage* 2018; 169:176-188

8. **M.E. MacDonald**, P. Dolati, A. Mitha, J.H. Wong, R. Frayne. Dynamic Phase Contrast Magnetic Resonance Imaging for the Assessment of Arteriovenious Malformation and Aneurysm Pressure. *Magnetic Resonance Imaging* 2016; 34, 1322-1328.

7. **M.E. MacDonald**, N.D. Forkert, G.B. Pike, R. Frayne. Phase Error Correction in Time-Averaged 3D Phase Contrast Magnetic Resonance Imaging of the Cerebral Vasculature. *Public Library of Science ONE* 2016. 11(2):1-15

6. **M.E. MacDonald**, P. Dolati, A. Mitha, M. Essa, J.H. Wong, R. Frayne. Flow and Hemodynamic Alteration in a Giant Cerebral Aneurysm Treated with a Pipeline Stent. *Radiology Case Reports* 2015; 10(2):1-7

5. **M.E. MacDonald**, R. Frayne. Cerebrovascular Magnetic Resonance Imaging: A Review of State-of-the-Art Approaches, Methods and Techniques. *NMR in Biomedicine* 2015; 28(7):767-791

4. **M.E. MacDonald**, R. Frayne. Phase Contrast MR Imaging Measurements of Blood Flow in Healthy Human Cerebral Vessel Segments. *Physiological Measurement* 2015; 36(7):1517-1527.

3. **M.E. MacDonald**, R.B. Stafford, J. Yerly, L. Andersen, C.M. McCreary, R. Frayne. Accelerated Passive MR Catheter Tracking into the Carotid Artery of Canines *Magnetic Resonance Imaging* 2013; 31(1):120-129.

2. N.E. Swailies, **M.E. MacDonald**, R. Frayne. Closed-Loop Circulation Phantom with Heart and Lung Motion for Validating Passive Magnetic Resonance Catheter Tracking. *Journal of Magnetic Resonance Imaging* 2011; 34(4):941-946.

1. **M.E. MacDonald**, M.R. Smith, R. Frayne. Deconvolution with Simple Extrapolation for Improved CBF Measurements in DSC-MRI during Acute Ischemic Stroke. *Magnetic Resonance Imaging* 2011; 29(1):620-629.

Peer Reviewed Manuscripts (Accepted)

1. L. Lo Vercio, K. Amador, J. Bannister, S. Crites, A. Gutierrez, **M.E. MacDonald**, J. Moore, P. Mouches, D. Rajasheka, S. Schimert, N. Subbanna, A. Tuladhar, N. Wang, M. Wilms, A. Winder, N.D. Forkert. Supervised machine learning tools: a tutorial for clinicians.(Accepted to the Journal of Neural Engineering: JNE-103635)

Peer Reviewed Manuscripts (Submitted)

1. D. Rajashekar, M. Wilms, **M.E. MacDonald**, M.D. Hill, S.P. Dukelow, N.D. Forkert. Lesion-symptom mapping with NIHSS sub-scores in ischemic stroke patients. (Submitted to Neuropsychologia, NSY-D-20-00569)

Manuscripts (In Progress)

5. **M.E. MacDonald**, N. Subbanna. Distributed Neural Networks
4. **M.E. MacDonald**, G.B. Pike. Bootstrapping Regression: How many subjects are required to establish a correlation?
3. **M.E. MacDonald**, R. Frayne, G.B. Pike, N.D. Forkert. Phase contrast MRI Atlas of the cerebral vasculature.
2. **M.E. MacDonald**, G.B. Pike. A Review of Brain Aging with MRI.
1. **M.E. MacDonald**, G.B. Pike, N.D. Forkert. Streamline guided interpolation of wind and phase contrast magnetic resonance velocity imaging.

International Conference Proceedings

44. D. Rajashekar, M. Wilms, **M.E. MacDonald**, S. Schimert, M. Hill, M. Goyal, A. Demchuk, S. Dukelow, N.D. Forkert. Lesion-deficit relationships defined using NIHSS sub-scores in acute ischemic stroke patients. *Submitted to 58th American Society of Neuroradiology Annual Meeting* May 22-27, 2021. pp #514
43. M. Wilms, J.J. Bannister, P. Mouches, **M.E. MacDonald**, D. Rajashekar, N.D. Forkert. Bidirectional Modeling and Analysis of Brain Aging with Normalizing Flows. *Machine Learning in Clinical Neuroimaging at MICCAI, Lima, Peru* October 4, 2020.
42. **M.E. MacDonald**, S. Scott, W.Q. Liu, Y. Zhang, L. Metz, G.B. Pike. The Impact of Multiple Sclerosis Lesion Tract Burden on the Cortex. *26th OHBM Scientific Meeting, Montreal, Canada* June 26-30, 2020. pp #401
41. S. Scott, **M.E. MacDonald**, D. Rajashekar, W.Q. Liu, H. Sun, L. Metz, Y. Zhang, G.B. Pike. A Clustering Analysis of MS Lesions with T1-T2-weighted, Diffusion, QSM, and MTR Imaging. *26th OHBM Scientific Meeting, Montreal, Canada* June 26-30, 2020. pp #286
40. H. Sun, **M.E. MacDonald**, R.M. Lebel, G.B. Pike. Simultaneous T1-weighted imaging, R2* mapping, and QSM from a multi-echo MPRAGE sequence using a radial fan-beam sampling scheme at 3 Tesla. *28th ISMRM Scientific Meeting, Sydney, Australia* April 18-23, 2020. pp #3207
39. M.A. McLean, R.M. Lebel, **M.E. MacDonald**, M. Boudreau, and G.B. Pike. Accelerated quantitative magnetization transfer (qMT) imaging using compressed sensing and parallel imaging. *28th ISMRM Scientific Meeting, Sydney, Australia* April 18-23, 2020. pp #3137
38. **M.E. MacDonald**, D. Rajashekar, R.J. Williams, H. Sun, C.R. McCreary, R. Frayne, N.D. Forkert, G.B. Pike. Machine learning methods for age prediction using cortical thickness and cerebral blood flow. *25th OHBM Scientific Meeting, Rome, Italy* June 9-13, 2019. pp #2704

37. H. Sun, **M.E. MacDonald**, E.L. Mazerolle, K. Sabourin, G.B. Pike. Localization of GPi for MRgFUS pallidotomy: a comparison between high-resolution FGATIR, R2* and QSM at 3 T *27th ISMRM Scientific Meeting, Montreal, Canada* May 11-16, 2019. Abstract #0800

36. **M.E. MacDonald**, W.Q. Liu, S. Scott, C.P. Rockel, D. Rajashekar, J.L. Specht, H. Sun, G.B. Pike. White Matter Tract-Defined Lesion Loads in Relapsing-Remitting Multiple Sclerosis. *27th ISMRM Scientific Meeting, Montreal, Canada* May 11-16, 2019. Abstract #3161

35. R.J. Williams, J. Specht, **M.E. MacDonald**, R.M. Lebel, E.L. Mazerolle, G.B. Pike. Accounting for vascular reactivity to clarify the role of the subcortical regions in attention. *24th OHBM Scientific Meeting, Singapore City, Singapore* June 16-21, 2018. pp #1761

34. **M.E. MacDonald**, N.D. Forkert, A. Hanganu, Y. Ma, R.J. Williams, H. Sun, R. Stafford, C.M. McCreary, R. Frayne, G.B. Pike. Cerebrovascular Brain Aging Examined with Arterial Spin Labelling and Applied to Age Prediction. *26th ISMRM Scientific Meeting, Paris, France* April 22-27, 2018.

33. R.J. Williams, E.L. Mazerolle, **M.E. MacDonald**, A.J.L. Berman, W.M. Luh, G.B. Pike. Flow and metabolic coupling associated with positive and negative BOLD responses across retinotopic early visual cortices. *3rd Imaging Cerebral Physiology Symposium, Cardiff, UK* June 8-9, 2017.

32. **M.E. MacDonald**, R.J. Williams, N.D. Forkert, A.J.L. Berman, C.M. McCreary, R. Frayne, G.B. Pike. Consistency of Inter-Database Cortical Thinning with Age. *25th ISMRM Scientific Meeting, Honolulu, HI* April 22-27, 2017. Abstract #0188

31. A.J.L. Berman, E.L. Mazerolle, **M.E. MacDonald**, N.P. Blockley, W.M. Luh, G.B. Pike. Correcting for imperfect spin echo refocusing in gas-free fMRI calibration. *25th ISMRM Scientific Meeting, Honolulu, HI* April 22-27, 2017. Abstract #1661

30. H. Sun, Y. Ma, **M.E. MacDonald**, G.B. Pike. Tikhonov regularization aided quantitative susceptibility mapping of whole brain without background field removal. *25th ISMRM Scientific Meeting, Honolulu, HI* April 22-27, 2017. Abstract #3668

29. M. Mclean, **M.E. MacDonald**, R.M. Lebel, M. Boudreau, G.B. Pike. Accelerated Z-Spectrum Imaging. *25th ISMRM Scientific Meeting, Honolulu, HI* April 22-27, 2017. Abstract #1205

28. H. Sun, **M.E. MacDonald**, Y. Ma, G.B. Pike. Regularization-aided susceptibility inversion without background field removal. *4th Quantitative Susceptibility Mapping Workshop, Graz, Austria* September 26-28, 2016. pp. 148

27. R.J. Williams, E. Mazerolle, **M.E. MacDonald**, W.M. Luh, G.B. Pike. Positive and negative BOLD and CBF responses across the early visual regions. *22nd Organization of Human Brain Mapping Annual Meeting, Geneva, Switzerland* June 26-30, 2016. Abstract#:2732

26. **M.E. MacDonald**, A.J.L. Berman, R.J. Williams, E.L. Mazerolle, G.B. Pike. Modeling Resting Cerebral Perfusion from BOLD Signal Dynamics During Hyperoxia. *24th ISMRM Scientific Meeting, Singapore City, Republic of Singapore.* May 7-13, 2016. pp. 3831

25. H. Sun **M.E. MacDonald**, G.B. Pike. Phase Correction of a Bipolar Gradient-Echo Acquisition for Quantitative Susceptibility Mapping. *24th ISMRM Scientific Meeting, Singapore City, Republic of Singapore.* May 7-13, 2016. pp. 2987

24. **M.E. MacDonald**, N.D. Forkert, G.B. Pike, R. Frayne. The Impact of Phase Errors on Mapping the Flow of the Cerebral Vasculature with Phase Contrast MRI. *21st OHBM Scientific Meeting, Honolulu, Hawaii, USA.* June 14-18, 2015. pp. 2431

23. **M.E. MacDonald**, A.J.L. Berman, R.J. Williams, E.L. Mazerolle, G.B. Pike. Bold Oxygenation Level Dependence (BOLD) Quantitative Susceptibility Mapping (QSM) at Different Head Orientations. *23rd ISMRM Scientific Meeting, Toronto, Canada.* May 30-June 5 2015. pp 2120

22. M.R. Smith, P. Adipour, J. Woehr, **M.E. MacDonald**. Overcoming the Image Position-Dependent Resolution Inherent in DFT and CS Reconstructions. *23rd ISMRM Scientific Meeting, Toronto, Canada.* May 30-June 5 2015.

21. **M.E. MacDonald**, R. Frayne. Comparing Blood Flow on Contralateral Sides of the Brain. *26th International Magnetic Resonance in Angiography Conference, Rome, Italy.* 16-19 Sept 2014.

20. A. Eilaghi, D.A. McLean, D.G. Gobbi, **M.E. MacDonald**, M.L. Lauzon, M. Salluzzi, R. Frayne. Quantitative Susceptibility Mapping in Human Brain with Normal Aging. *3rd International Workshop on MRI Phase Contrast & Quantitative Susceptibility Mapping, Duke University. Durham, N.C., USA.* 6-8 October, 2014. pp 56

19. **M.E. MacDonald**, P. Dolati, J.H. Wong, R. Frayne. Blood Volume Flow Rates of Vessels in the Healthy Human Cerebral Vasculature. *22nd ISMRM Scientific Meeting, Milan, Italy.* 10-16 May 2014. pp 1839

18. **M.E. MacDonald**, M.L. Lauzon, R. Frayne. Imaging Battery for Brain Quantification. *22nd ISMRM Scientific Meeting, Milan, Italy.* 10-16 May 2014. pp 1513

17. **M.E. MacDonald**, E. Lee, T. Lee, J. Woehr, C. d'Esterre, M.R. Smith, R. Frayne. Dual Compartmental Fitting of Dynamic Susceptibility Contrast MRI in Early Ischemic Stroke. *22nd ISMRM Scientific Meeting, Milan, Italy.* 10-16 May 2014. pp 4601

16. **M.E. MacDonald**, P. Dolati, A. Mitha, J. Wong, R. Frayne. Phase Contrast Magnetic Resonance Imaging in Cerebrovascular Malformations: Towards Pressure Estimation. *25th International Workshop on Magnetic Resonance Angiography, New York, United States.* 20-23 August, 2013, pp 45

15. E. Lee, **M.E. MacDonald**, R. Frayne.Improving Dynamic Contrast Enhanced MR Perfusion Measurements by Appropriate Selection of Acquisition Parameters. *25th International Workshop on Magnetic Resonance Angiography, New York, United States.* 20-23 August, 2013, pp 154

14. M.R. Smith, J. Woehr, E. Marasco, **M.E. MacDonald**. Impact of DFT Properties on the Inherent Resolution of Compressed Sensing Reconstruction Images *24th Irish Signals and Systems Conference, Letterkenny, Ireland* 20-21 June, 2013. pp 1-8

13. **M.E. MacDonald**, R.M. Lebel, R. Frayne. Passive Magnetic Resonance Catheter Tracking with Spatial Wavelet and Temporal Constraints *21st ISMRM Scientific Meeting, Salt Lake City, United States* 20-26 April, 2013. pp 5232

12. **M.E. MacDonald**, N. Swailes, M.R. Smith, J. Nielsen, R. Frayne. The Cramer Rao Lower Bound of Magnetic Resonance Phase Image Acquisitions: Comparison with Bayesian Constrained Reconstruction. *Accelerated Magnetic Resonance Imaging 3rd International Workshop, Freiburg, Germany*, 23-24th Sept 2012.

11. **M.E. MacDonald**, P. Dolati, J.H. Wong, T. Leung, J. Nielsen, R. Frayne. Sensitivity of phase-contrast derived velocity and stress fields to receiver bandwidth at the circle of Willis. *24th Annual International Magnetic Resonance Angiography Club Meeting, Utrecht, Netherlands*, 19-21 Sept 2012. pp 4.4.

10. **M.E. MacDonald**, P. Dolati, L. Anderson, C.R. McCreary, J.H. Wong, R. Frayne. Measurement of Perfusion during Transient Carotid Occlusion. *20th ISMRM Scientific Meeting, Melbourne, Australia*, 5-12 May 2012. pp 1026.

9. S. Beladi, C.R. McCreary, E.E. Smith, M.L. Lauzon, **M.E. MacDonald**, R. Frayne. Quantitative Susceptibility Mapping as an Improved Biomarker for Cerebral Microbleeds in Small Vessel Disease. *20th ISMRM Scientific Meeting, Melbourne, Australia*, 5-12 May 2012. pp 1027.

8. **M.E. MacDonald**, D. Adair, P. Dolati, J. Yerly, R. Frayne. Real-Time 3D MRI with Random Undersampling Trajectories to Visualize Endovascular Catheters and Contrast Inflow. *20th ISMRM Scientific Meeting, Melbourne, Australia*, 5-12 May 2012. pp 2274.

7. **M.E. MacDonald**, L.B. Anderson, C.R. McCreary, R. Frayne. Catheter Tracking using Passive Magnetic Resonance Imaging into the Ascending Aorta. *23rd International Magnetic Resonance Angiography Club Meeting, Banff, AB, Canada*, 25-28 September 2011. pp 158

6. M.R. Smith, **M.E. MacDonald**, E. Marasco, M. Salluzzi, P. Gauderon, R. Frayne. Which 1980's and 1990's super-resolution reconstruction ideas would prove useful when 2011's compressed sensing reconstruction is used for MR sparse angiography? *23rd International Magnetic Resonance Angiography Club Meeting, Banff, AB, Canada*, 25-28 September 2011. pp 141

5. **M.E. MacDonald**, M.L. Lauzon, J. Nielsen, R. Frayne. Determining the Cramer Rao Lower Bound of Magnetic Resonance Imaging. *Joint American Association of Medical Physicists (AAPM) and Canadian Organization of Medical Physicists (COMP) Scientific Meeting, Vancouver, Canada*, July 31-Aug 4 2011. pp 3425

4. **M.E. MacDonald**, N. Swailes, L.B. Andersen, C.R. McCreary, R. Frayne. Guidance to the Branching Vessels of the Aortic Arch with Passive MR Catheter Tracking. *19th ISMRM Scientific Meeting, Montréal, Canada*, 7-13 May 2011. pp 771

3. **M.E. MacDonald**, M.R. Smith, R. Frayne. Improving CBF Image Contrast with Frequency Extrapolation for DSC-MRI during Acute Stroke. *19th ISMRM Scientific Meeting, Montreal, Canada*, 7-13 May 2011. pp 1976

2. **M.E. MacDonald**, R.B. Stafford, M.L. Lauzon, R. Frayne. One step real-time image correction with GUSTO (Gradient-warp and UnderSampling Transform Operator). *18th ISMRM Scientific Meeting, Stockholm, Sweden*, 1-7 May 2010. pp 3109

1. R.B. Stafford, **M.E. MacDonald**, R. Frayne. Real-Time Gradient Warp Correction with OpenGL NURBS Surfaces. *18th ISMRM Scientific Meeting, Stockholm, Sweden*, 1-7 May 2010. pp 3110

National Conference Proceedings

9. W.Q. Liu, **M.E. MacDonald**, R. Pasha, J. Greenfield, G. Cerchiaro, Y. Zhang, V.W. Yong, G.B. Pike, L.M. Metz. Pilot Trial of Domperidone for Remyelination in Relapsing Remitting Multiple Sclerosis. *endMS Conference 2019, Calgary, Alberta*, 8-11 Dec 2019.

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5. E. Lee, **M.E. MacDonald**, R. Frayne. Enhanced Dynamic Contrast Enhanced (DCE) MR for Brain Perfusion Imaging. *4th Canadian Stroke Congress, Montreal*, 17-20 Aug 2013. pp 28

4. A. Eilaghi, **M.E. MacDonald**, C.R. McCreary, M.L. Lauzon, E.E. Smith, D.G. Gobbi, M. Salluzzi, R. Frayne. Characterization of Cerebral Microbleeds using Quantitative Susceptibility Mapping: Role of Imaging Clinical Trials of Dementia and Small Vessel Disease. *4th Molecular Function and Imaging Symposium, Ottawa*, 27-28 June 2013. pp 21.

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24. **M.E. MacDonald**. Imaging Aging with MRI. *NSERC I3T CREATE Seminar Series*, March 26th, 2015.

23. **M.E. MacDonald**, R. Frayne. Blood Flow through the Brain Measured with Phase Contrast MR Imaging. *Department of Radiology Research Day*, June 12th, 2014.

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