

Paul Polak, PhD

Research Interests

Novel MRI pulse sequence development, image reconstruction, analysis software, non-conventional MRI techniques for use in neurological disorders and other chronic diseases.

Professional Experience

- **Philips Healthcare**

Clinical Scientist

Aurora, CO
Apr 2026 - current

University of Colorado Anschutz Medical School

Adj. Assistant Professor

Drive clinical innovation through strategic partnerships at University of Colorado Anschutz and Children's Hospital Colorado.

- Cultivate high-impact collaborations with renowned clinical leaders to advance image-guided therapies and expand spectral CT innovation.
- Accelerate adoption of technology to improve patient care in structural, coronary, and congenital heart disease.
- Prepare statements of work and contracting exhibits which exist under existing MRA, RCA, and IRB documents.
- **Key skills:** scientific collaborations, scientific communications, image analysis, project management, IRB documents

- **United Imaging Healthcare**

Senior Collaboration Scientist

Houston, TX (remote)
Apr 2024 - Feb 2026

Provide scientific expertise on MRI to key opinion leaders (KOLs) in academia. Collaborate with academic sites to produce scientific output to market United Imaging's technology.

- Scientifically collaborate with academic sites and KOLs to produce research papers and abstracts.
- Provide technical MRI expertise for pre-sales visits nationally and internationally, including both formal presentations and ad-hoc Q&A sessions.
- First-author of whitepaper: "uMR Jupiter: Seeing the Unseen" for UIH's flagship MRI. Enthusiastic reception from company marketing and requests for more papers.
- Represented UIH at international conferences (ISMRM, SCMR, JPR) and MR workshops.
- Developed pulse sequence development in ADEPT which resulted in an abstract at ISMRM 2025.
- **Key skills:** project management, ADEPT, scientific communications, public speaking, marketing material creation

- **University of Colorado Anschutz Medical School**

Post-Doctoral Researcher

Aurora, CO
Nov 2021 - Mar 2024

Conduct scientific research into pediatric and fetal cardiac imaging at University of Colorado's Anschutz Medical Campus. Use ML and advanced image reconstruction techniques to supplement clinical information and inform diagnoses and treatment options.

- Lead a team of 7 Research Assistants on a project for fetal brain segmentation of MRI images. Teach students to perform manual segmentations and train an ML algorithm to accelerate the manual segmentation process. Project goal is to understand why CO babies have lower birth weights.

- Spearhead a project testing Doppler ultrasound versus self-gating for fetal cardiac MRI. Project is testing a "self-gating" method that requires no extra hardware or set-up. Initial results have proven promising. Results could lead to a more streamlined workflow, less maternal discomfort, and faster examinations.
- Published 3 first-author abstracts at international scientific conferences to date.
- Analyzed data using Python, NumPy, SciPy, Matplotlib, pandas, and PyTorch.
- **Key skills:** project leadership, ML, Python, NumPy, SciPy, Matplotlib, image processing, software development

- **McMaster University**
Biomedical Engineering Doctoral Researcher

Hamilton, ON
Sep 2014 - May 2022

Conceptualized and managed research project that demonstrated methods to obtain human brain images for ²³Na (sodium) MRI. Thesis concluded that developing human brain sodium MRI would be an invaluable tool to diagnose pathologies including MS, stroke, epilepsy, and cancer (<http://hdl.handle.net/11375/27792>).

- Earned 5 awards including 2 external fellowships (\$100K CAD) based on research / academic excellence.
- Developed research skills in novel pulse sequence development, image reconstruction, analysis software, and non-conventional MRI techniques for neurological disorders and other chronic diseases (e.g., MS).
- Adapted quickly when Covid-19 pandemic forced a change in research approach and topic.
- Published 3 peer-reviewed papers (2 as first-author) and 7 abstracts at international conferences.
- **Key skills:** data analysis, project management, experimental design, scientific communications, Python

- **Buffalo Neuroimaging Analysis Center**
MRI Physicist

Buffalo, NY
May 2010 - Apr 2016

Working under a world-renowned MS researcher, designed, developed, and implemented pulse sequences on 1.5T and 3T scanners, with emphasis on brain, optic nerve, and spinal cord. Conducted pulse sequence programming with EPIC for GE 1.5T and 3T. Developed protocols for diffusion, functional, magnetization-transfer, and spectroscopic imaging. Trained MRI technologists to run MRI research protocols.

- Worked full-time while pursuing PhD. Published 15 peer-reviewed papers (2 first-author) and 30 abstracts.
- Developed an MRI sequence to see white matter lesions in MS patients better than typical clinical sequences. Published findings in Magnetic Resonance in Medicine; sequence has subsequently been implemented in clinical settings (<https://pubmed.ncbi.nlm.nih.gov/22139997/>).
- Earned Magna Cum Laude award in 2015 at the International Society for Magnetic Resonance in Medicine, submitted 2 successful grant applications (\$30K USD), and delivered 2 invited talks.
- Served as Lead Technical Consultant for MRI protocol standardization for multiple vendors (GE, Philips, Siemens) for clinical trials (both Stage 2 and 3).
- **Key skills:** NumPy, SciPy, Matplotlib, image processing, software development, biomedical engineering

- **Sunnybrook Research Institute**
MRI Physicist / Programmer

Toronto, ON
Jan 2009 - Dec 2009

Designed and implemented MRI protocols for real-time MRI thermometry to monitor in vivo prostate cancer treatment via interventional ultrasound at one of Canada's top 10 research hospitals.

- Hired based on MRI expertise. Communicated MRI knowledge to improve team's efficiency and effectiveness. Team's efforts resulted in a successful human trial.
- **Key skills:** software development, scientific communications, teamwork, MRI protocol design

- **Various**
IT Consultant

Boston, MA, USA and Ontario, Canada
1998 - 2006

Developed, designed, and provided online information solutions for clients in the US and Canada. Handled business development, client satisfaction, requirements, scope, and implementation while delivering timely solutions. Resigned from consulting to pursue education in biomedical engineering.

Education

- **McMaster University**
Ph.D. Biomedical Engineering

Hamilton, ON
Graduated: May 2022

- Thesis: Development of Human Brain Sodium Magnetic Resonance Imaging (^{23}Na MRI) Methods
- ^{23}Na MRI, UTE MRI, image reconstruction, RF coil construction
- Open Access URL: <http://hdl.handle.net/11375/27792>

- **McMaster University**
M.A.Sc. Biomedical Engineering

Hamilton, ON
Graduated: May 2009

- Thesis: Implementation of Durga - a pseudo-random, non-Cartesian sampling scheme
- ultra-fast, 3-D, non-Cartesian MRI pulse sequence development; image reconstruction

Technical Skills

Languages: Python, EPIC (GE), RSDE (Toshiba/Canon), C/C++, Perl, MATLAB, PHP, Java

Medical Imaging: DICOM, NiftI, FSL, SPM, Freesurfer

MRI: United Imaging; GE; Siemens; Philips; Toshiba/Canon; RF coil design, tuning, and matching

Operating Systems: Linux (RedHat, Gentoo, Ubuntu, etc.), UNIX (Solaris), Windows

Databases: MySQL, Oracle, SQL Server, MS Access

UNIX: GNU tools (GCC, GDB), Bash, Csh, Awk, Make, CMake, Git / Github

Applications: L^AT_EX, OpenOffice, Microsoft Office

Publications

Scopus ID: 57022369500

orcid.org: 0000-0002-7719-7572

Google Scholar: <https://scholar.google.com/citations?user=UvHuBpQAAAAJ>

- **Polak P**, Schulte RF, Noseworthy MD. *An Approach to Evaluation of the Point Spread Function (PSF) for ^{23}Na MRI*. NMR in Biomedicine. 2022 Feb; 35(2):e4627. doi: 10.1002/nbm.4627. PMID: 34652040.
- **Polak P**, Van Tuyl J, Engel R. *Imaging Chronic Traumatic Encephalopathy: A Biomedical Engineering Perspective*. Crit Rev Biomed Eng. 2017; doi:10.1615/CritRevBiomedEng.2017021970. PMID: 29431093.
- **Polak P**, Leddy JJ, Dwyer MG, Willer B, Zivadinov R. *Diffusion Tensor Imaging Alterations in Post-Concussion Syndrome Patients Undergoing Exercise Treatment: A Pilot Longitudinal Study*. J Head Trauma Rehabil. 2014; doi:10.1097/HTR.000000000000037. PMID: 24721808.
- **Polak P**, Magnano C, Zivadinov R, Poloni GU. *3D FLAIRE: 3D Fluid Attenuated Inversion Recovery for Enhanced Detection of Lesions in Multiple Sclerosis*. Magn Reson Med. 2012 Sep; 68(3):874-81. doi:1002/mrm.23289. PMID: 22139997.
- Nowikow CE, **Polak P**, Konyer NB, Nikolova NK, Noseworthy MD. *Network and Field Analysis of Koch Snowflake Fractal Geometry Radiofrequency Coils for Sodium MRI*, Front Phys. 2021 Aug; doi:10.3389/fphy.2021.697104.
- Zivadinov R, **Polak P**, Schweser F, Bergsland N, Hagemeyer J, Dwyer MG, Ramasamy DP, Baker JG, Leddy JJ, Willer BS. *Multimodal Imaging of Retired Professional Contact Sport Athletes Does Not Provide Evidence of Structural and Functional Brain Damage*. J Head Trauma Rehabil. 2018 Sep/Oct; 33(5):E-35-E32. doi: 10.1097/HTR.0000000000000422. PMID: 30080799.
- Hagemeyer J, Zivadinov R, Dwyer MG, **Polak P**, Bergsland NP, Weinstock-Guttman B, Zalis J, Deistung A, Reichenbach JR, Schweser F. *Changes of deep gray matter magnetic susceptibility over 2 years in multiple sclerosis and healthy control brain*. NeuroImage: Clin. 2017 Apr; 18:1007-1016. doi: 10.1016/j.nicl.2017.04.008. PMID: 29868452.
- Hanspach J, Dwyer MG, Bergsland NP, Feng X, Hagemeyer J, Bertolino N, **Polak P**, Reichenbach JR, Zivadinov R, Schweser F. *Methods for the computation of templates from quantitative magnetic susceptibility maps (QSM): Toward improved atlas- and voxel-based analyses (VBA)*. J Magn Reson Imaging. 2017 Nov; 46(5): 1474-1484. doi: 10.1002/jmri.25671. PMID: 28263417.
- Zivadinov R, Ramasamy DP, Vaneckova M, Gandhi S, Chandra A, Hagemeyer J, Bergsland N, **Polak P**, Benedict RH, Hojnacki D, Weinstock-Guttman B. *Leptomeningeal contrast enhancement is associated with progression of cortical atrophy in MS: A retrospective, pilot, observational longitudinal study*. Mult Scler. 2017 Sep; 23(10):1336-1345. doi: 10.1177/1352458516678083. PMID: 27811339.
- Modica C, Schweser F, Sudyn M, Bertolino N, Preda M, **Polak P**, Siebert D, Krawiecki J, Sveinsson M, Hagemeyer J, Dwyer MG, Pol S, Zivadinov R. *Effect of teriflunomide on cortex-basal ganglia-thalamus (CxBGTh) circuit glutamatergic dysregulation in the Theiler's Murine Encephalomyelitis Virus mouse model of multiple sclerosis*. PLoS ONE. 2017 Aug; 12(8):e0182729. doi: 10.1371/journal.pone.0182729. PMID: 28796815.
- Feng X, Deistung A, Dwyer MG, Hagemeyer J, **Polak P**, Lebenberg J, Frouin F, Zivadinov R, Reichenbach JR, Schweser F. *An Improved FSL-FIRST Pipeline for Subcortical Gray Matter Segmentation to Study Abnormal Brain Anatomy Using Quantitative Susceptibility Mapping (QSM)*. Mag Reson Imag. 2017 Jun; 39:110-22. doi: 10.1016/j.mri.2017.02.002. PMID: 28188873.

- Zivadinov R, Ramadamy DP, Benedict RHB, **Polak P**, Hagemeier J, Magnano C, Dwyer MG, Bergsland N, Bertolino N, Weinstock-Guttman B, Kolb C, Hojnacki D, Utriainen D, Haacke EM, Schweser F. *Cerebral Microbleeds in Multiple Sclerosis Evaluated on Susceptibility-Weighted Imaging and Quantitative Susceptibility Mapping. A Case-Control Study*. Radiology. 2016 Jun. doi: 10.1148/radiol.2016160060. PMID: 27308776.
- Cesar B, Dwyer MG, Shucard JL, **Polak P**, Bergsland N, Benedict RHB, Weinstock-Guttman B, Shucard DW, Zivadinov R. *Cognitive and White Matter Tract Differences in MS and Diffuse Neuropsychiatric Systemic Lupus Erythematosus*. AJNR. 2015 Oct; 36(10):1874-83. doi:10.3174/ajnr.A4354. PMID: 26066628.
- Wack DS, **Polak P**, Furuyama J, Burkard R. *Masking Level Difference - a Diffusion Tensor Imaging and Functional MRI Study*. PLoS ONE. 2014 Feb; 9(2):e88466. doi:10.1371/journal.pone.0088466. PMID: 24558392.
- Aliotta R, Cox JL, Donohue K, Weinstock-Guttman B, Yeh A, **Polak P**, Dwyer MG, Zivadinov R. *Tract-based statistics (TBSS) analysis of diffusion-tensor imaging in pediatric- and adult-onset multiple sclerosis*. Human Brain Mapping. 2014 Jan; 35(1):53-60. doi: 10.1002/hbm.22148. PMID: 22936429.
- Hagemeier J, Dwyer MG, Bergsland N, Schweser F, Magnano C, Heininen-Brown M, Ramasamy DP, Carl E, Kennedy C, Melia R, **Polak P**, Deistung A, Geurts JJG, Reichenbach JR, Zivadinov R. *Effect of age on MRI phase behavior in the subcortical deep gray matter of healthy individuals*. American Journal of Neuroradiology. 2013 Nov-Dec; 34(11):2144-51. doi: 10.3174/ajnr.A3569. PMID: 23721902.
- Beggs C, Shephard S, Dwyer MG, **Polak P**, Magnano C, Carl E, Poloni GU, Weinstock-Guttman B, Zivadinov R. *Sensitivity and specificity of SWI venography for detection of cerebral venous alterations in multiple sclerosis*. Neurological Research. 2012 Oct; 34(8):793-801. doi: 10.1179/1743132812Y.0000000048. PMID: 22709857.

Abstracts

- International Society for Magnetic Resonance in Medicine 2025 - Singapore, SG
 - Dong Y, **Polak P**, Zhong Z, Zhao C, Hu J, Li B, Fang F, Ye Y. *Application of Multi-Echo SSFP Sequences Using Multiple Pathways on Short T2 Mapping*
- Society of Pediatric Radiology 2024 - Miami, FL
 - Browne L, Friesen RM, Englund EK, Fujiwara T, **Polak P**, Smith S, Cuneo B, Moghari MH, Zaretsky MV, Meyers ML, Bucholz EM, Obregon CL, Barker AJ. *Predictive Capability of Fetal 4D Flow and Black Blood Slice to Volume Reconstruction for Prenatal Diagnosis of Coarctation of the Aorta (CoA) - John Caffey Award for Best Clinical Science Paper*
- Society for Cardiac Magnetic Resonance 2024 - London, UK
 - **Polak P**, Fujiwara T, Englund EK, Barker AJ, Cuneo B, Lloyd DFA, Browne LP, Friesen RM, Moghari MH. *3D Black Blood Images in the Assessment of Fetal Extracardiac Vasculature*
 - Romanowicz J, Bunn J, Englund EK, Khailova L, **Polak P**, Frank B, Zablah J, Barker AJ, Moghari MH, Davidson JA. *Utilization of T2 prep for MR oximetry combined with 4D flow phase contrast imaging for evaluation of extracardiac organ oxygen metabolism in Fontan patients*
 - Friesen RM, Englund EK, Fujiwara T, Smith SA, **Polak P**, Cuneo B, Moghari MH, Bucholz EM, Zaretsky M, Obregon CLL, Barker AJ, Browne LP. *Predictive Capability of Fetal 4D Flow and Black Blood Slice to Volume Reconstruction for Prenatal Diagnosis of Coarctation of the aorta (CoA)*

- World Congress of Pediatric Cardiology and Cardiac Surgery - Washington, DC
 - **Polak P**, Fujiwara T, Englund EK, Barker AJ, Cuneo B, Lloyd DFA, Browne LP, Friesen RM, Moghari MH. *Evaluation of 3D Black Blood Images in Fetal Cardiovascular Magnetic Resonance*
- International Society for Magnetic Resonance in Medicine 2023 - Toronto, ON, Canada
 - **Polak P**, von Kleist H, Hott M, Englund EK, Barker AJ, Cuneo B, Friesen RM, Browne LP, Moghari MH. *Fetal Cardiovascular Magnetic Resonance: A Comparison of Doppler Ultrasound and Self-Gating Techniques*
 - Nowikow CE, **Polak P**, Noseworthy MD. *Time-of-Day Analysis of Cerebral Sodium TSC Maps*
- Society of Pediatric Radiology 2023 - Austin, TX
 - **Polak P**, von Kleist H, Hott M, Englund EK, Barker AJ, Friesen RM, Browne LP, Moghari MH. *Doppler Ultrasound versus Self-Gating in Fetal Cardiovascular Magnetic Resonance*
- Society for Cardiac Magnetic Resonance 2023 - San Diego, CA
 - **Polak P**, von Kleist H, Hott M, Englund EK, Barker AJ, Friesen RM, Browne LP, Moghari MH. *Comparison of Doppler Ultrasound and Self-Gating Techniques for Fetal Cardiac MRI*
- International Society for Magnetic Resonance in Medicine 2022 - London, UK
 - Nowikow CE, **Polak P**, Noseworthy MD. *Variability in Brain Sodium Total Sodium Content (TSC) Mapping Quantification Methods*
- European Society for Magnetic Resonance in Medicine and Biology 2021 - online
 - **Polak P**, Noseworthy MD. *Diffusion tensor imaging and sodium (^{23}Na) MRI – a correlation study*
- European Society for Magnetic Resonance in Medicine and Biology 2020 - online
 - **Polak P**, Schulte R, Noseworthy MD. *Measurement of ^{23}Na point-spread function (PSF) in ultrashort TE (UTE) acquisitions in a 3D printed resolution phantom*
 - **Polak P**, Noseworthy MD. *The effect of noise in measurement of the ^{23}Na modulation transfer function (MTF): a simulation study*
- International Society for Magnetic Resonance in Medicine 2020 - online
 - Konyer NB, Menon N, **Polak P**, Nair P, Noseworthy MD, Svenningsen S. *^{129}Xe Discrete Wavelet Transform (DWT) Denoising of Hyperpolarized MR Images*
- International Society for Magnetic Resonance in Medicine 2019 - Montreal, QC, Canada
 - **Polak P**, Schulte R, Noseworthy, MD. *Measurement of ^{23}Na MRI point-spread function (PSF) using a 3D printing resolution phantom*
- Radiology Research Day 2019 - Hamilton, ON, Canada
 - **Polak P**, Schulte R, Noseworthy MD. *In vivo ^{23}Na brain MRI with compressed sensing techniques - Award: 1st prize, Graduate Student Talk*
- Imaging Network of Ontario 2018 - Toronto, ON, Canada
 - **Polak P**, Noseworthy MD. *Compressed sensing reconstruction with ^{23}Na MRI*
- European Society for Magnetic Resonance in Medicine and Biology 2017 - Barcelona, Spain
 - **Polak P**, Noseworthy MD. *Evaluation of compressed sensing reconstruction schemes for 3D radial projections with ^{23}Na MRI*

- Radiological Research Day 2017 - Hamilton, ON, Canada
 - **Polak P**, Akbari A, Noseworthy MD. *Evaluation of reduced sampling schemes with 3D radial projections for ^{23}Na MRI* - **Award: 2nd prize, Graduate Student Talk**
- Imaging Network of Ontario 2017 - London, ON, Canada
 - **Polak P**, Akbari A, Noseworthy MD. *Evaluation of reduced sampling schemes with 3D radial projections for ^{23}Na MRI*
- European Committee for Treatment and Research in Multiple Sclerosis 2016 - London, UK
 - Modica CM, Schweser F, Sudyn M, Bertolino N, **Polak P**, Siebert D, Krawiecki J, Preda M, Sveinsson M, Dwyer MG, Zivadinov R. *Teriflunomide (Aubagio) reduces glutamate, and possible excitotoxicity, in cortico-basal ganglionic-thalamo-cortical connectivity in mouse model of multiple sclerosis*
 - Zivadinov R, Benedict RR, Ramasamy DP, **Polak P**, Hagemeyer, Magnano C, Dwyer MG, Bergsland N, Bertolino N, Weistock-Guttman B, Kolb C, Hojnacki D, Utriainen D, Haacke EM, Schweser F. *Cerebral Microbleeds in Multiple Sclerosis Evaluated on Susceptibility-Weighted Imaging and Quantitative Susceptibility Mapping are Associated with More Severe Cognitive and Physical Outcomes*
- International Society for Magnetic Resonance in Medicine 2016 - Singapore, SG
 - **Polak P**, Linder D, Hanspach J, Zivadinov R, Bertolino N, Dwyer MG, Bergsland N, Schweser F. *Gradient Unwarping: Reverse Engineering the Warpfield with Spherical Harmonics*
 - Schweser F, Li W, Sun H, Zhou D, Bertolino N, **Polak P**, Wang Y, Wilman AH, Bredies K, Zivadinov R, Robinson SD. *An illustrated comparison of background field elimination methods for phase MRI and QSM*
 - Schweser F, Hagemeyer J, **Polak P**, Dwyer MG, Bergsland NP, Bertolino N, Weinstock-Guttman B, Deistung A, Reichenbach JR, Zivadinov R. *Quantitative Susceptibility Mapping (QSM) in patients with clinically isolated syndrome (CIS) and multiple sclerosis (MS) - a large cohort study*
 - Schweser F, Modica CM, Bertolino N, **Polak P**, Preda M, Zivadinov R. *Feasibility of 50um in vivo MR microscopy (uMRI) of mouse brain at 9.4 Tesla*
 - Schweser F, Bertolino N, Dwyer MG, Hagemeyer J, **Polak P**, Bergsland N, Deistung A, Weinstock-Guttman B, Reichenbach JR, Zivadinov R. *A longitudinal assessment of brain iron using quantitative susceptibility mapping (QSM) in multiple sclerosis (MS) over 2 years*
 - Bertolino N, Modica CM, Dwyer MG, **Polak P**, Rudra T, Preda M, Krawiecki JC, Barbieri JM, Sudyn M, Siebert DM, Zivadinov R, Schweser F. *Longitudinal characterization of the Theiler's Murine Encephalomyelitis Virus (TMEV) mouse model using a cryogenic brain coil at 9.4T*
 - Bertolino N, Dwyer MG, **Polak P**, Robinson SD, Zivadinov R, Schweser F. *Effect of patient motion on the visibility of small veins in $T2^*w$ imaging: A simulation experiment with implications for the study of the central-vein-sign (CVS) theory in MS*
 - Schweser F, **Polak P**, Bertolino N, Zivadinov R. *QUASAR: In vivo quantification of magnetic susceptibility in rodents*
 - Bertolino N, **Polak P**, Preda M, Zivadinov R, Schweser F. *9.4 Tesla 1H-MRS of Glutamate and GABA in a 3.6 cubic-mm volume using an optimized UTE-STEAM sequence*
 - Hanspach J, Dwyer MG, Bergsland NP, Feng X, Hagemeyer J, **Polak P**, Bertolino N, Zivadinov R, Schweser F. *Toward a voxel-based analysis (VBA) of quantitative magnetic susceptibility maps (QSM): Strategies for creating brain susceptibility templates*
 - Schweser F, Rattan D, Hagemeyer J, **Polak P**, Dwyer MG, Magnano CR, Zivadinov R. *Magnetic Susceptibility (QSM) of Thalamic Sub-Nuclear Groups in Multiple Sclerosis*
- American Academy of Neurology 2016 - Vancouver, BC, Canada

- Hagemeyer J, Schweser F, Dwyer MG, **Polak P**, Bergsland N, Weinstock-Guttman B, Zivadinov R. *Evolution of brain iron levels in multiple sclerosis: a 2-year longitudinal quantitative susceptibility mapping study at 3T*
- Hagemeyer J, Schweser F, Dwyer MG, **Polak P**, Bergsland N, Weinstock-Guttman B, Zivadinov R. *Quantitative susceptibility mapping study of deep gray matter iron at 3T in large cohort of multiple sclerosis patients*
- North American Imaging in Multiple Sclerosis 2015 - Los Angeles, CA, USA
 - Schweser F, Ramasamy DP, **Polak P**, Hagemeyer J, Magnano C, Dwyer MG, Bertolino N, Weinstock-Guttman B, Kolb C, Benedict RHB, Hojnacki D, Haacke EM, Zivadinov R. *Cerebral microbleeds in multiple sclerosis. A case-control study*
 - Hagemeyer J, Schweser F, Dwyer MG, **Polak P**, Bergsland N, Weinstock-Guttman B, Zivadinov R. *Evolution of brain iron levels in multiple sclerosis: a 2-year longitudinal quantitative susceptibility mapping study at 3T*
 - Hagemeyer J, Schweser F, Dwyer MG, **Polak P**, Bergsland N, Weinstock-Guttman B, Zivadinov R. *Deep gray matter iron in clinically isolated syndrome and multiple sclerosis: a quantitative susceptibility mapping study at 3T*
- European Committee for Treatment and Research in Multiple Sclerosis 2015 - Barcelona, Spain
 - Zivadinov R, Ramadamy DP, **Polak P**, Hagemeyer J, Magnano C, Dwyer MG, Bertolini N, Weinstock-Guttman B, Kolb C, Benedict RHB, Hojnacki D, Haacke EM, Schweser F. *Cerebral microbleeds in multiple sclerosis. A case-control study.*
- International Society for Magnetic Resonance in Medicine 2015 - Toronto, ON, Canada
 - **Polak P**, Zivadinov R, Schweser F. *Rapid phase imaging with 3D echo-planar imaging (EPI) for quantitative MRI: A simulation study on image artifacts*
 - **Polak P**, Zivadinov R, Schweser F. *Gradient Unwarping for Phase Imaging Reconstruction*
 - **Polak P**, Zivadinov R, Schweser F. *On the limitations of brain lesion characterization by direct assessment of MRI phase - Award: Magna cum laude*
 - Schweser F, Rattan D, Hagemeyer J, **Polak P**, Dwyer MG, Magnano CR, Zivadinov. *Magnetic Susceptibility (QSM) of Thalamic Sub-Nuclear Groups in Multiple Sclerosis*
 - Nakarmi U, Prasad S, Ying L, **Polak P**, Zivadinov R, Schweser F. *Compressed Sensing (CS) in phase imaging requires dedicated reconstruction strategies*
- MRI Phase Contrast and Quantitative Susceptibility Mapping 2014 - Raleigh, NC, USA
 - **Polak P**, Zivadinov R, Schweser F. *Gradient Unwarping for Phase Imaging and QSM*
 - Nakami U, Ying L, **Polak P**, Zivadinov R, Schweser F. *Compressed Sensing in phase imaging requires dedicated reconstruction strategies*
- International Society for Magnetic Resonance in Medicine 2014 - Salt Lake City, UT, USA
 - Hagemeyer J, Dwyer MG, Bergsland N, Schweser F, Magnano C, Heininen-Brown M, Ramasamy DP, Carl E, Kennedy C, Cherneva M, Melia R, **Polak P**, Deistung A, Reichenbach JR, Zivadinov R. *Establishing MRI phase, abnormal MRI phase, and volume behavior in the subcortical deep gray matter of healthy individuals.*
- American Medical Society for Sports Medicine 2014 - New Orleans, LA, USA
 - Leddy J, **Polak P**, Baker JG, Zivadinov R, Willer B. *Advanced MRI Techniques Differ in Concussion Assessment*
- American Academy of Neurology 2013 - San Diego, CA, USA
 - Cesar B, Shucard JL, Dwyer MG, **Polak P**, Bergsland N, Benedict RHB, Shucard DW, Zivadinov R. *Comparing white matter tracts of patients with relapsing-remitting multiple sclerosis, systemic lupus erythematosus and healthy controls using tract-based spatial statistics (TBSS)*

- European Committee for Treatment and Research in Multiple Sclerosis 2012 - Lyon, France
 - Beggs CB, Shepherd SJ, Dwyer MG, **Polak P**, Magnano C, Carl E, Poloni GU, Weinstock-Guttman B, Zivadinov R. *Sensitivity and specificity of SWI venography for detection of cerebral venous alterations in multiple sclerosis*
- International Society for Magnetic Resonance in Medicine 2011 - Montreal, QC, Canada
 - **Polak P**, Magnano C, Zivadinov R, Poloni GU. *3D DIR - 3D Double Inversion Recovery in Multiple Sclerosis*
 - **Polak P**, Magnano C, Zivadinov R, Poloni GU. *3D FLAIRE - 3D Fluid Attenuated Inversion Recovery for Enhanced Detection of Lesions in Multiple Sclerosis*
- European Society for Magnetic Resonance in Medicine and Biology 2008 - Valencia, Spain
 - **Polak P**, Anand C, Noseworthy M. *Application of Durga - a fast, non-Cartesian volumetric sampling scheme*

Invited Talks

- 8th Annual MRI Symposium 2013, Mount Sinai Hospital, Toronto, ON, Canada. *Understanding Image Artifacts in MRI*
- North American Brain Injury Society 2013, New Orleans, LA, USA. *Magnetic Resonance Imaging in Concussion: A Structural Approach*
- North American Brain Injury Society 2013, New Orleans, LA, USA. *Neuro Imaging Panel*

Invited Papers

- **Polak P**. *Structural Magnetic Resonance Imaging in Concussion*. Brain Injury Professional. 2013; 10(3):10-12.

Research Funding

- Academic Scholarships
 - Mitacs Accelerate Fellowship – PhD
 - * \$45000 CAD, 2019
 - Ontario Graduate Scholarship – PhD
 - * \$15000 CAD, 2017 - 2018
 - McMaster University Graduate Scholarship (Biomedical Engineering) – PhD full time
 - * \$19650 CAD, 2016 - 2017
 - McMaster University Graduate Scholarship (Biomedical Engineering) – PhD part time
 - * \$4000 / year CAD, 2014 - 2016
 - McMaster University Graduate Scholarship (Biomedical Engineering) – MASc
 - * \$18500 / year CAD, 2006 - 2008
- The Jacobs Neurological Institute - Jog for the Jake 2011
 - Role: Principal Investigator
 - Funding: \$15000 USD

- 3D Double Inversion Recovery Pulse Sequence Development for Increased Visibility of T2 Lesion Load in Multiple Sclerosis Patients
- The Jacobs Neurological Institute - Jog for the Jake 2011
 - Role: co-Investigator
 - Funding: \$15000 USD
 - Develop and apply a vein extraction algorithm for the quantification of the cerebral vein vasculature from Susceptibility Weighted sequences

Software Community

Github: <https://github.com/AbstractMethod>

- Finance::Quote: Perl stock and mutual fund quotes from various exchanges
- Gentoo Science Overlay: Gentoo Linux ebuild repository which provides numerous scientific software packages