

## **Douglas C. Noll**

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### **EDUCATION**

|           |   |
|-----------|---|
| 1981-1985 | Bucknell University, Lewisburg, PA<br>B.S., Electrical Engineering, summa cum laude, May 1985   |
| 1985-1986 | Stanford University, Stanford, CA<br>M.S., Electrical Engineering, June 1986  |
| 1987-1991 | Stanford University, Stanford, CA<br>Ph.D., Electrical Engineering, August 1991<br>Thesis: Reconstruction Techniques for Magnetic Resonance Imaging<br>Advisor: Dr. Albert Macovski |

### **PROFESSIONAL EXPERIENCE**

|              |   |
|--------------|---|
| 1985-1987    | Member of Technical Staff, AT&T Bell Labs, Whippany, NJ   |
| 1990         | Teaching Fellow, Department of Electrical Engineering, Stanford University                                    |
| 1991-1997    | Assistant Professor of Radiology (primary), University of Pittsburgh, Pittsburgh, PA                          |
| 1992-1997    | Assistant Professor of Electrical Engineering, University of Pittsburgh                                       |
| 1991-1995    | Visiting Assistant Professor of Computer Science<br>Carnegie Mellon University, Pittsburgh, PA                |
| 1997-1998    | Associate Professor of Radiology (primary), University of Pittsburgh  |
| 1997-1998    | Acting Administrative Director, MR Research Center<br>University of Pittsburgh Medical Center, Pittsburgh, PA |
| 1998-2005    | Associate Professor of Biomedical Engineering (primary), University of Michigan                               |
| 1999-2006    | Associate Professor of Radiology, University of Michigan  |
| 2006-2007    | Interim Chair of Biomedical Engineering, University of Michigan   |
| 2007-2013    | Chair of Biomedical Engineering, University of Michigan   |
| 2013-2014    | Visiting Professor of Electrical Engineering, Stanford University   |
| 1998-Present | Co-Director, Functional MRI Laboratory, University of Michigan  |
| 2005-Present | Professor of Biomedical Engineering (primary), University of Michigan   |
| 2006-Present | Professor of Radiology, University of Michigan  |
| 2007-Present | Ann and Robert H. Lurie Professor of Biomedical Engineering, University of Michigan                           |

## PROFESSIONAL AND SCIENTIFIC SOCIETIES

Institute of Electrical and Electronics Engineers (Fellow), 1983-present  
International Society of Magnetic Resonance in Medicine (Fellow), 1990-present  
(formerly Society of Magnetic Resonance in Medicine and Society of Magnetic Resonance)  
International Organization for Human Brain Mapping, 1998-2003  
American Institute for Medical and Biological Engineering (Fellow), 2001-present  
Biomedical Engineering Society (Fellow), 2005-present  
International Society to Advance Alzheimer's Research and Treatment, 2023-present

## HONORS AND AWARDS

Dean's List, Bucknell University (8 semesters), 1981-1985  
President's Award for Outstanding Academic Achievement, Bucknell University, 1984  
Tau Beta Pi Engineering Honor Society, 1984  
Graduated summa cum laude, Bucknell University, 1985  
Cum Laude Poster Award, Society of Magnetic Resonance Imaging, 1991  
Isador I. Rabi Award, Society of Magnetic Resonance, 1994  
Elected to Board of Trustees, International Society of Magnetic Resonance in Medicine, 2000.  
Outstanding Achievement Award, Dept. of Biomedical Engineering, University of Michigan, 2000  
Elected Fellow, American Institute for Medical and Biological Engineering, 2001  
Trudy Huebner Service Excellence Award, College of Engineering, University of Michigan, 2003  
Outstanding Teacher Award, International Society of Magnetic Resonance in Medicine Annual Meeting, 2005  
Outstanding Teacher Award, International Society of Magnetic Resonance in Medicine Annual Meeting, 2006  
Appointed Ann and Robert H. Lurie Professor of Biomedical Engineering, University of Michigan, 2007  
Outstanding Teacher Award, International Society of Magnetic Resonance in Medicine Annual Meeting, 2007  
Elected Fellow, International Society of Magnetic Resonance in Medicine, 2008  
Elected Fellow, Biomedical Engineering Society, 2012  
Senior Member, Institute of Electrical and Electronics Engineers, 2012  
Phi Kappa Phi Honor Society, faculty member, 2013-2015  
Elected Fellow, Institute of Electrical and Electronics Engineers, 2023

## PUBLICATIONS

Publication summary from Scopus, Mar 2024 - Total citations: > 23,000, h-index: 63.  
Publication summary from Google Scholar, Mar 2024 - Total citations: > 37,000, h-index: 72.

### Refereed Journal Articles:

1. Noll DC, Nishimura DG, Macovski A. Homodyne detection in magnetic resonance imaging. IEEE Trans. on Medical Imaging, 10(2):154-163, 1991.

2. Noll DC, Meyer CH, Pauly JM, Nishimura DG, Macovski A. A homogeneity correction method for MR imaging with time-varying gradients. IEEE Trans. on Medical Imaging, 10(4):629-637, 1991.
3. Noll DC, Pauly JM, Meyer CH, Nishimura DG, Macovski A. De-blurring for non-2D Fourier transform magnetic resonance imaging. Magnetic Resonance in Medicine, 25:319-333, 1992.
4. Bergin CJ, Noll DC, Pauly JM, Glover GH, Macovski A. MRI of lung parenchyma - A solution to susceptibility, Radiology, 183:673-676, 1992.
5. Glover GH, Noll DC. Consistent projection reconstruction techniques for MRI. Magnetic Resonance in Medicine, 29:345-352, 1993.
6. Schneider W, Noll DC, Cohen JD. Functional topographic mapping of human visual cortex using conventional MRI. Nature, 365:150-153 1993.
7. Cohen JD, Noll DC, Schneider W. Functional magnetic resonance imaging: Overview and methods for psychological research. Behavior Research Methods, Instruments, & Computers, 25(2):101-113, 1993.
8. Noll DC. Variable Averaging RARE. Magnetic Resonance in Medicine, 31:323-327, 1994.
9. Schneider W, Casey BJ, Noll DC. Mapping activation stimulus rate dependence for characters across multiple visual processing stages with fMRI. Human Brain Mapping, 1:117-133, 1994.
10. Cohen JD, Forman SD, Braver TS, Casey BJ, Servan-Schreiber D, Noll DC. Activation of prefrontal cortex in a non-spatial working memory task with functional MRI. Human Brain Mapping, 1:293-304, 1994.
11. Noll DC, Cohen JD, Meyer CH, Schneider W. Spiral k-space MRI of cortical activation. J. Magnetic Resonance Imaging, 5:49-56, 1995 (Recipient of the 1994 Isador I. Rabi Award from the Society of Magnetic Resonance).
12. Pelc NJ, Drangova M, Pelc LR, Zhu Y, Noll DC, Bowman B, Herfkens RJ. Tracking of cyclical motion using phase contrast cine MRI velocity data. J. Magnetic Resonance Imaging, 5:339-345, 1995.
13. Forman SD, Cohen JD, Fitzgerald M, Eddy WF, Mintun MA, Noll DC. Improved assessment of significant change in functional magnetic resonance imaging (fMRI): Use of a cluster size threshold. Magnetic Resonance in Medicine, 33:636-647, 1995.
14. Noll DC, Webb JA, Warfel TE. Parallel Fourier inversion by the scan-line method. IEEE Trans. on Medical Imaging, 14:454-463, 1995.
15. Casey BJ, Cohen JD, Jezard P, Turner R, Noll DC, Trainor RJ, Giedd J, Kaysen D, Hertz-Pannier L, Rapoport JL. Activation of prefrontal cortex in children during a non-spatial working memory task with functional MRI. NeuroImage, 2:221-229, 1995.
16. Baumann SB, Noll DC, Kondziolka D, Schneider W, Nichols T, Mintun MA, Lewine J, Yonas H, Scabassi R. Comparison of functional MRI with PET and MEG to identify the motor cortex in a patient with arteriovenous malformation. J. Image Guided Surgery, 1:191-197, 1995.
17. Small SL, Noll DC, Perfetti CA, Hlustik P, Wellington R, Schneider W. Localizing the lexicon for reading aloud: Replication of a PET study using fMRI. NeuroReport, 7:961-965, 1996.
18. Eddy WF, Fitzgerald M, Noll DC. Improved registration of MR images using Fourier domain interpolation. Magnetic Resonance in Medicine, 36:923-931, 1996.
19. Witt TC, Kondziolka D, Baumann SB, Noll DC, Small SL, Lundsford LD. Preoperative Cortical Localization with Functional MRI for Using in Stereotactic Radiosurgery. Stereotactic and Functional Neurosurgery, 66:24-29, 1996.
20. Braver TS, Cohen JD, Jonides J, Smith EE, Noll DC. A parametric study of prefrontal cortex involvement in human working memory. NeuroImage, 5:49-62, 1997.
21. Cohen JD, Perlstein WM, Braver TS, Nystrom LE, Noll DC, Jonides J, Smith EE. Temporal dynamics of brain activation during a non-spatial working memory task. Nature, 386:604-608, 1997.
22. Genovese CR, Noll DC, and Eddy WF. Estimating test-retest reliability in functional MR imaging I: Statistical methodology. Magnetic Resonance in Medicine, 38:497-507, 1997.

23. Noll DC, Genovese CR, Nystrom L, Vazquez A, Forman SD, Eddy WF, Cohen JD. Estimating test-retest reliability in functional MR imaging II: Application to motor and cognitive activation studies. Magnetic Resonance in Medicine, 38:508-517, 1997.
24. Noll DC, Boada FE, Eddy WF. A spectral approach to analyzing slice selection in planar imaging: Optimization for through-plane interpolation. Magnetic Resonance in Medicine, 38:151-160, 1997.
25. Noll DC. Multi-shot rosette trajectories for spectrally selective MR imaging. IEEE Trans. on Medical Imaging, 16:372-377, 1997.
26. Barch DM, Braver TS, Nystrom LE, Forman SD, Noll DC, Cohen JD. Dissociating effort from active memory in prefrontal cortex: an fMRI study. Neuropsychologia, 35:1373-1380, 1997.
27. Boada FE, Gillen JS, Noll DC, Shen GX, Thulborn KR. k-space trajectory design for fast quantitative sodium imaging. International Journal of Imaging Systems and Technology, 8:544-550, 1997.
28. Goddard NH, Hood G, Cohen JD, Eddy WF, Genovese GR, Noll DC. Online analysis of functional MRI datasets on parallel platforms. Journal of Supercomputing, 11:295-318, 1997.
29. Casey BJ, Trainor RJ, Orendi JL, Schubert AB, Nystrom NE, Giedd JN, Castellanos X, Haxby J, Noll DC, Cohen JD, Forman SD, Dahl RE, Rapoport JL. A developmental functional MRI study of prefrontal activation during performance of a Go-No-Go task. J. Cognitive Neuroscience, 9:835-847, 1997.
30. Talagala SL, Noll DC. Functional MRI using steady-state arterial water labeling. Magnetic Resonance in Medicine, 39:179-183, 1998.
31. \*Vazquez AL, Noll DC. Non-linear aspects of the blood oxygenation response in functional MRI. NeuroImage, 7:108-118, 1998.
32. Noll DC, \*Peltier SJ, Boada FE. Simultaneous multislice acquisition using rosette trajectories (SMART): A new imaging method for functional MRI. Magnetic Resonance in Medicine, 39:709-716, 1998.
33. Carter CS, Braver TS, Barch DM, Botvinick M, Noll D, Cohen JD. Anterior cingulate cortex, error detection, and the on line monitoring of performance. Science, 280:747-749, 1998.
34. \*Hlustik P, Noll DC, Small SL. Suppression of vascular artifacts in functional magnetic resonance images using MR angiograms. NeuroImage, 7:224-231, 1998.
35. Small SL, Flores D, Noll DC. Different neural circuits subserve reading before and after therapy for acquired dyslexia. Brain and Language, 62:298-308, 1998.
36. \*Stenger VA, Noll DC, Boada FE. Partial Fourier reconstruction for three-dimensional gradient echo functional MRI: A comparison of phase correction methods. Magnetic Resonance in Medicine, 40:481-490, 1998. PMID: 9727953.
37. Noll DC, Genovese CR, Vazquez AL, O'Brien JL\*, Eddy WF. Evaluation of respiration artifact correction techniques in functional MRI using receiver operator characteristic analyses. Magnetic Resonance in Medicine, 40:633-639, 1998.
38. Casey BJ, Cohen JD, O'Craven K, Davidson RJ, Irwin W, Nelson CA, Noll DC, Hu X, Lowe MJ, Rosen B, Truwitt C, Turski P. Reproducibility of fMRI results across four institutions using a spatial working memory task. NeuroImage, 8:249-261, 1998.
39. \*Stenger VA, Peltier SJ, Boada FE, Noll DC. 3D spiral cardiac/respiratory ordered fMRI data acquisition at 3 Tesla. Magnetic Resonance in Medicine, 41:983-991, 1999. PMID: 10332882.
40. \*Peltier SJ, Noll DC. Noise compensation for simultaneous multislice acquisition using rosette trajectories (SMART). Magnetic Resonance in Medicine, 41:1073-1076, 1999.
41. Kinahan PE, Noll DC. A direct comparison between whole-brain PET and BOLD fMRI measurements of single subject activation response. NeuroImage, 9:430-438, 1999.
42. Thomas KM, King SW, Franzen PL, Welsh TF, Berkowitz AL, Noll DC, Birmaher V, Casey BJ. A developmental functional MRI study of spatial working memory. NeuroImage, 10:327-338, 1999.

43. Baumann SB, Noll DC. A modified electrode cap for EEG recordings in MRI scanners. Clinical Neurophysiology, 110:2189-2193, 1999.
44. Barch DM, Sabb FW, Carter CS, Braver TS, Noll DC, Cohen JD. Overt verbal responding during fMRI scanner: Empirical investigations of problems and potential solutions. Neuroimage, 10:642-57, 1999.
45. Carter CS, MacDonald AM, Ross LL, Stenger VA, Noll D, Cohen JD. Parsing executive processes: strategic versus evaluative functions of the anterior cingulate cortex. Proc. of the Nat. Acad. Sci., USA, 97(4):1944-8, 2000. PMID: 10677559.
46. Barch DM, Sabb FW, Braver TS, Noll DC. Anterior cingulate and the monitoring of response conflict: Evidence from an fMRI study of overt verb generation. J. Cognitive Neuroscience, 12(2):298-309, 2000.
47. Nystrom LE, Braver TS, Sabb FW, Delgado MR, Noll DC, Cohen JD. Working memory for letters, shapes and locations: fMRI evidence against stimulus-based regional organization in human prefrontal cortex. NeuroImage, 11, 424-446, 2000.
48. Stenger VA, Boada FE, Noll DC. Three-dimensional tailored RF pulses for the reduction of susceptibility artifacts in gradient echo functional MRI. Magnetic Resonance in Medicine, 44:525-531, 2000. PMID: 11025507.
49. Delgado MR, Nystrom LE, Fissel C, Noll DC, Fiez JA. Tracking the hemodynamic responses to reward and punishment in the striatum. J. Neurophysiology, 84:3072-3077, 2000.
50. Barch DM, Carter CS, Braver TS, Sabb FW, MacDonald A, Noll DC, Cohen JD. Selective deficits in prefrontal cortex function in medication-naive patients with schizophrenia. Archives of General Psychiatry, 58(3):280-8, 2001.
51. Hlustik P, Solodkin A, Gullapalli RP, Noll DC, Small SL. Somatotopy in Human Primary Motor and Somatosensory Hand Representations Revisited, Cereb. Cortex, 11:312-321, 2001.
52. Casey BJ, Forman SD, Franzen P, Berkowitz A, Braver TS, Nystrom LE, Thomas KM, Noll DC. Sensitivity of prefrontal cortex to changes in target probability: A functional MRI study. Human Brain Mapping, 13:26-33, 2001.
53. Burton MW, Noll DC, Small SL. The anatomy of auditory word processing: Individual Variability. Brain & Language, 77(1):119-31, 2001.
54. Perlstein WM, Carter CS, Noll DC, Cohen JD. Relation of prefrontal cortex dysfunction to working memory and symptoms in schizophrenia. American Journal of Psychiatry, 158(7):1105-13, 2001.
55. Solodkin A, Hlustik P, Noll DC, Small SL. Lateralization of motor circuits and handedness during finger movements. European Journal of Neurology, 8:425-434, 2001.
56. Hlustik P, Solodkin A, Gullapalli RP, Noll DC, Small SL. Functional lateralization of the human premotor cortex during sequential movements. Brain & Cognition, 49:54-62, 2002.
57. Stenger VA, Boada FE, Noll DC. Multishot 3D slice-select tailored RF pulses for MRI. Magnetic Resonance in Medicine, 48:157-165, 2002.
58. Small SL, Hlustik P, Noll DC, Genevese C, Solodkin A. Cerebellar hemispheric activation ipsilateral to the paretic hand correlates with functional recovery after stroke. Brain, 125:1544-1557, 2002.
59. \*Peltier SJ, Noll DC. T2\* dependence of low-frequency functional connectivity. NeuroImage, 16:985-992, 2002.
60. Hernandez L, Badre D, Noll DC, Jonides J. Temporal sensitivity of event related fMRI. NeuroImage, 17:1018-1026, 2002.
61. \*Sutton BP, Noll DC, Fessler JA. Fast, iterative image reconstruction for MRI in the presence of field inhomogeneities. IEEE Trans. on Medical Imaging, 22(2):178-188, 2003.
62. Perlstein WM, Dixit NK, Carter CS, Noll DC, Cohen JD. Prefrontal cortex dysfunction mediates deficits in working memory and prepotent responding in schizophrenia. Biological Psychiatry, 53(1):25-38, 2003.
63. Phan KL, Taylor SF, Welsh RC, Decker LR, Noll DC, Nichols TE, Britton JC, Liberzon I. Activation of the medial prefrontal cortex and extended amygdala by individual ratings of emotional arousal: a fMRI study. Biological Psychiatry, 53(3):211-5, 2003.

64. \*Peltier SJ, Polk TA, Noll DC. Detecting low-frequency functional connectivity in fMRI using a self-organizing map (SOM) algorithm. Human Brain Mapping, 20(4):220-226, 2003.
65. Stenger VA, Boada FE, Noll DC. Variable-density spiral 3D tailored RF pulses. Magnetic Resonance in Medicine, 50:1100-1106, 2003.
66. Park DC, Welsh RC, Marshuetz C, Gutchess AH, Mickels J, Polk TA, Noll DC, Taylor SF. Working memory for complex scenes: Age differences in frontal and hippocampal activations. J. Cognitive Neuroscience, 15(8):1122-34, 2003.
67. Hernandez-Garcia L, \*Lee GR, Vazquez AL, Noll DC. Fast, pseudo-continuous arterial spin labeling for functional imaging using a two-coil system. Magnetic Resonance in Medicine, 51:577-585, 2004.
68. \*Sutton BP, Noll DC, Fessler JA. Dynamic field map estimation using a spiral-in/spiral-out acquisition. Magnetic Resonance in Medicine, 51:1194-1204, 2004.
69. Seidler RD, Noll DC, Thiers G. Feedforward and Feedback Processes in Motor Control. NeuroImage, 22(4):1775-83, 2004.
70. Hlustik P, Solodkin A, Noll DC, Small SL. Cortical plasticity during three-week motor skill learning. J. Clin. Neurophys., 21:180-191, 2004.
71. Saekho S, Boada FE, Noll DC, Stenger VA. A small-tip angle 3D tailored RF slab-select pulse for reduced B1 inhomogeneity at 3T. Magnetic Resonance in Medicine, 53:479-484, 2005.
72. Noll DC, Fessler JA, Sutton BP. Conjugate phase MRI reconstruction with spatially variant sample density compensation. IEEE Transactions on Medical Imaging, 24:325-36, 2005.
73. Wager TD, Vazquez AL, Hernandez-Garcia L, Noll DC. Accounting for nonlinear BOLD effects in fMRI: Parameter estimates and a model for prediction in rapid event-related studies. NeuroImage, 25:206-18, 2005.
74. Fessler JA, \*Lee S, \*Olafsson VT, Shi H, Noll DC. Toeplitz-based iterative image reconstruction for MRI with correction for magnetic field inhomogeneity. IEEE Transactions on Signal Processing, 53:3393-3402, 2005.
75. \*Yip C-Y, Fessler JA, Noll DC. Iterative RF pulse design for multidimensional, small-tip-angle selective excitation. Magnetic Resonance in Medicine, 54(4):908-917, 2005. PMID: 16155881.
76. Hernandez-Garcia L, \*Lee GR, \*Vazquez AL, Noll DC. Quantification of Perfusion fMRI using a numerical model of arterial spin labeling accounting for dynamic transit time effects. Magnetic Resonance in Medicine, 54(4):955-964, 2005. PMID: 16155868
77. \*Martinez FM., Swanson S, Noll DC, Anderson DJ. Magnetic Resonance Compatibility of Multichannel Silicon Microelectrode Systems for Neural Recording and Stimulation: Design criteria, test, and recommendations. IEEE Transactions on Biomedical Engineering, 53(3):547-558, 2006.
78. Marshuetz C, Reuter-Lorenz PA, Smith EE, Jonides J, Noll DC. Working memory for order and the parietal cortex: an event-related functional magnetic resonance imaging study. Neuroscience, 139(1):311-6, 2006.
79. \*Vazquez AL, \*Lee GR, Hernandez-Garcia L, Noll DC. Application of Selective Saturation to Image the Dynamics of Arterial Blood Flow during Brain Activation using MRI. Magnetic Resonance in Medicine, 55(4):816-25, 2006.
80. Saekho S, Yip CY, Noll DC, Boada FE, Stenger VA. Fast-kz three-dimensional tailored radiofrequency pulse for reduced B1 inhomogeneity. Magnetic Resonance in Medicine, 55(4):719-24, 2006. PMID: 16526012
81. Seidler RD, Noll DC, Chintalapati PR. Basal ganglia activation associated with sensorimotor adaptation. Experimental Brain Research, 175(3):544-55, 2006.
82. \*Vazquez AL, Cohen ER, Gulani V, Hernandez-Garcia L, Zheng Y, Lee GR, Kim S-G, Grotberg JB, Noll DC. Vascular Dynamics and BOLD fMRI: CBF Level Effects and Analysis Considerations. NeuroImage, 32(4):1642-55, 2006.
83. Stenger VA, Giurgi MS, Boada FE, Noll DC. Excitation UNFOLD (XUNFOLD) to improve the temporal resolution of multishot tailored RF pulses. Magnetic Resonance in Medicine, 56(3):692-7, 2006

84. \*Grissom W, Yip CY, Zhang Z, Stenger VA, Fessler JA, Noll DC. A spatial domain method for the design of RF pulses in multi-coil parallel excitation. Magnetic Resonance in Medicine, 56(3):620-9, 2006. PMID: 16894579
85. \*Yip CY, Fessler JA, Noll DC. Advanced three-dimensional tailored RF pulse for signal recovery in T2\*-weighted functional MRI. Magnetic Resonance in Medicine, 56(5):1050-9, 2006. PMID: 17041911
86. \*Martinez-Santesteban FM, Swanson S, Noll DC, Anderson DJ. Magnetic field perturbation of neural recording and stimulating microelectrodes. Phys. Med. Biol., 52(8):2073-88, 2007.
87. \*Lee GR, Hernandez-Garcia L, Noll DC. Functional imaging with turbo-CASL: Transit time and multislice imaging considerations. Magnetic Resonance in Medicine, 57(4):661-9, 2007.
88. Zhang Z, Yip CY, Grissom W, Noll DC, Boada FE, Stenger VA. Reductions of B1 inhomogeneity with transmit SENSE slice-select pulses. Magnetic Resonance in Medicine, 57(5):842-7, 2007. PMCID: PMC3041897.
89. \*Yip CY, Grissom WA, Fessler JA, Noll DC. Joint design of trajectory and RF pulses for parallel excitation. Magnetic Resonance in Medicine, 58(3):598-604, 2007. PMID: 17763362
90. Langenecker SA, Kennedy SE, Guidotti LM, Briceno EM, Own LS, Hooven T, Young EA, Akil H, Noll DC, Zubieta JK. Frontal and Limbic Activation During Inhibitory Control Predicts Treatment Response in Major Depressive Disorder. Biol Psychiatry, 62(11):1272-80, 2007. PMCID: PMC2860742
91. Anguera JA, Russell CA, Noll DC, Seidler RD. Neural correlates associated with intermanual transfer of sensorimotor adaptation. Brain Res, 1185:136-51, 2007.
92. Seidler RD, Noll DC. Neuroanatomical correlates of motor acquisition and motor transfer. J Neurophysiol., 99(4):1836-45, 2008.
93. \*Grissom WA, Yip CY, Wright SM, Fessler JA, Noll DC. Additive angle method for fast large-tip-angle RF pulse design in parallel excitation. Magnetic Resonance in Medicine, 59(4):779-87, 2008. PMID: 18383288
94. Gulani V, Adusumilli S, Hussain HK, Vazquez AL, Francis IR, Noll DC. Apparent wall thickening of cystic renal lesions on MRI. J Magn Reson Imaging, 28(1):103-10, 2008.
95. Waugh CE, Wager TD, Fredrickson BL, Noll DC, Taylor SF. The neural correlates of trait resilience when anticipating and recovering from threat. Soc Cogn Affective Neurosci, 3(4):322-32, 2008. doi: 10.1093/scan/nsn024 PMCID: PMC2607054
96. \*Olafsson VT, Noll DC, Fessler JA. Fast joint reconstruction of dynamic R2\* and field maps in functional MRI. IEEE Trans Med Imaging, 27(9):1177-88, 2008. PMID: 18753040
97. Funai AK, Fessler JA, Yeo DTB, Olafsson VT, Noll DC. Regularized field map estimation in MRI. IEEE Trans Med Imaging, 27(10):1484-94, 2008. PMCID: PMC2856353
98. \*Yip CY, Yoon D, Olafsson V, Lee S, Grissom WA, Fessler JA, Noll DC. Spectral-spatial pulse design for through-plane phase precompensatory slice selection in T2\*-weighted functional MRI. Magnetic Resonance in Medicine, 61:1137-1147, 2009. PMID: 19267346, PMCID: PMC2856348.
99. Wager TD, Waugh CE, Lindquist M, Noll DC, Fredrickson BL, Taylor SF. Brain mediators of cardiovascular responses to social threat, Part I: Reciprocal dorsal and ventral sub-regions of the medial prefrontal cortex and heart-rate reactivity. NeuroImage, 47:821-835, 2009. PMCID: PMC3275821.
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101. Cimprich B, Reuter-Lorenz P, Nelson J, Clark PM, Therrien B, Normolle D, Berman MG, Hayes DF, Noll DC, Peltier S, Welsh RC. Prechemotherapy alterations in brain function in women with breast cancer. J Clin Exp Neuropsychol, 32(3):324-31, 2010. PMID: 19642048.
102. Bo J, Peltier SJ, Noll DC, Seidler RD. Symbolic representations in motor sequence learning. Neuroimage, 54(1):417-26, 2011. PMCID: PMC2962690
103. \*Jahanian H, Noll DC, Hernandez-Garcia L. B(0) field inhomogeneity considerations in pseudo-continuous arterial spin labeling (pCASL): effects on tagging efficiency and correction strategy. NMR Biomed, 24(10):1202-9, 2011.

104. Langenecker SA, Weisenbach SL, Giordani B, Briceño EM, Guidotti Breting LM, Schallmo MP, Leon HM, Noll DC, Zubieta JK, Schteingart DE, Starkman MN. Impact of chronic hypercortisolemia on affective processing. Neuropharmacology, 62(1):217-25, .2011. PMID: PMC3196277
105. Bo J, Peltier SJ, Noll DC, Seidler RD. Age differences in symbolic representations of motor sequence learning. Neurosci Lett. 504(1):68-72, 2011. PMID: PMC3186876
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107. \*Farjam R, Parmar HA, Noll DC, Tsien CI, Cao Y. An approach for computer-aided detection of brain metastases in post-Gd T1-W MRI. Magn Reson Imaging. Jul;30(6):824-36, 2012.
108. \*Zhao F, Noll DC, Nielsen JF, Fessler JA. Separate magnitude and phase regularization via compressed sensing. IEEE Trans Med Imaging. 31(9):1713-23, 2012. PMID: PMC3545284.
109. Nielsen JF, \*Yoon D, Noll DC. Small-tip fast recovery imaging using non-slice-selective tailored tip-up pulses and radiofrequency-spoiling. Magn Reson Med, 69(3):657-66, 2013. PMID: PMC3408566.
110. Briceño EM, Weisenbach SL, Rapport LJ, Hazlett KE, Bieliauskas LA, Haase BD, Ransom MT, Brinkman ML, Peciña M, Schteingart DE, Starkman MN, Giordani B, Welsh RC, Noll DC, Zubieta JK, Langenecker SA. Shifted inferior frontal laterality in women with major depressive disorder is related to emotion-processing deficits. Psychol Med. 8:1-13, 2013.
111. Berman MG, Askren MK, Sook Jung M, Therrien B, Peltier S, Noll DC, Zhang M, Ossher L, Hayes DF, Reuter-Lorenz PA, Cimprich B. Pretreatment worry and neurocognitive responses in women with breast cancer. Health Psychol. 33(3):222-31, 2014. Aug 5.
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113. \*Harrivel AR, Weissman DH, Noll DC, Peltier SJ. Monitoring attentional state with fNIRS. Frontiers in Human Neuroscience, 7:861, 2013. PMID: PMC3861695.
114. Sun H, Fessler JA, Noll DC, Nielsen JF. Strategies for improved 3D small-tip fast recovery imaging. Magn Reson Med. 2015 Feb;73(2):536-43. doi: 10.1002/mrm.25381 (cover art)
115. \*Zhao F, Nielsen JF, Noll DC. Four-Dimensional Spectral-Spatial Fat Saturation Pulse Design. Magn Reson Med. 2014 Dec;72(6):1637-47. doi: 10.1002/mrm.25076. PMID: PMC4061276.
116. \*Zhao F, Fessler JA, Wright SM, Noll DC Regularized Estimation of Magnitude and Phase of Multi-Coil B1 Field via Bloch-Siegert B1 Mapping and Coil Combination Optimizations. IEEE Trans Med Imaging, 2014 Oct;33(10):2020-30. doi: 10.1109/TMI.2014.2329751. PMID: PMC4190000.
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118. Sun H, Fessler JA, Noll DC, Nielsen JF. Steady-State Functional MRI Using Spoiled Small-Tip Fast Recovery Imaging. Magn Reson Med. 2015 Feb;73(2):536-43. doi: 10.1002/mrm.25146.
119. \*Muckley MJ, Noll DC, Fessler JA. Fast Parallel MR Image Reconstruction via B1-based, Adaptive Restart, Iterative Soft Thresholding Algorithms (BARISTA). IEEE Trans Med Imaging, 2015 Feb;34(2):578-88. PMID: PMC4315709



120. \*Jahanian H, Peltier S, Noll DC, Hernandez Garcia L. Arterial cerebral blood volume-weighted functional MRI using pseudocontinuous arterial spin tagging (AVAST). Magn Reson Med. 2015 Mar;73(3):1053-64. doi: 10.1002/mrm.25220.
121. \*Zhao F, Nielsen JF, Swanson SD, Fessler JA, Noll DC. Simultaneous fat saturation and magnetization transfer contrast imaging with steady-state incoherent sequences. Magn Reson Med. 2015 Sep;74(3):739-46. doi: 10.1002/mrm.25475. PMID: PMC4369465.
122. Sun H, Fessler JA, Noll DC, Nielsen JF. Balanced SSFP-Like Steady-State Imaging Using Small-Tip Fast Recovery With a Spectral Prewinding Pulse. Magn Reson Med. 2016; 75(2):839-44. doi: 10.1002/mrm.25682. PMID: PMC4704999.
123. Nielsen JF, Noll DC. Improved spoiling efficiency in dynamic RF-spoiled imaging by ghost phase modulation and temporal filtering. Magn Reson Med. 2016 75(6):2388-93. doi: 10.1002/mrm.25843. PMID: PMC4587989.
124. Sun H, Fessler JA, Noll DC, Nielsen JF. Joint design of excitation k-space trajectory and RF pulse for small-tip 3D tailored excitation in MRI. IEEE Trans Med Imaging. 2016; 35(2):468-79. PMID: PMC4792784.
125. \*Chu A, Noll DC. Coil Compression in Simultaneous Multislice Functional MRI with Concentric Ring Slice-GRAPPA and SENSE. Magn Reson Med. 2016 Oct;76(4):1196-209 doi: 10.1002/mrm.26032.
126. Sun H, Fessler JA, Noll DC, Nielsen JF. Rapid Inner-Volume Imaging in the Steady-State With 3D Selective Excitation and Small-Tip Fast Recovery. Magn Reson Med. 2016 Oct;76(4):1217-23. doi: 10.1002/mrm.26026.
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129. Crane NA, Jenkins LM, Dion C, Meyers KK, Weldon AL, Gabriel LB, Walker SJ, Hsu DT, Noll DC, Klumpp H, Phan KL, Zubieta J-K, & Langenecker SA. Comorbid Anxiety Increases Cognitive Control Activation in Major Depressive Disorder. Depression and Anxiety. 2016 Oct;33(10):967-977 doi: 10.1002/da.22541.
130. \*Ropella KM & Noll DC. A regularized, model-based approach to phase-based conductivity mapping using MRI. Magn Reson Med. 2017 Nov;78(5):2011-2021. doi: 10.1002/mrm.26590
131. \*Nejad-Davarani SP, Bagher-Ebadian H, Ewing JR, Noll DC, Mikkelsen T, Chopp M, Jiang Q. An extended vascular model for less biased estimation of permeability parameters in DCE-T1 images. NMR Biomed. 2017 Jun;30(6). doi: 10.1002/nbm.3698.
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134. Nielsen JF, Noll DC. TOPPE: A framework for rapid prototyping of MR pulse sequences. Magn Reson Med. 2018 79(6): 3128–3134 doi: 10.1002/mrm.26990.
135. \*Olafsson VT, Noll DC, Fessler JA. Fast Spatial Resolution Analysis of Quadratic Penalized Least-Squares Image Reconstruction with Separate Real and Imaginary Roughness Penalty: Application to fMRI. IEEE Trans Med Imaging. 2018 Feb;37(2):604-614. doi: 10.1109/TMI.2017.2768825.

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138. \*Weller DS, Noll DC, Fessler JA. Real-time filtering with sparse variations for head motion in magnetic resonance imaging. Signal Processing. 2019 Apr;157:170-179. doi: 10.1016/j.sigpro.2018.12.001.
139. \*Luo T, Noll DC, Fessler JA, Nielsen JF. A GRAPPA algorithm for arbitrary 2D/3D non-Cartesian sampling trajectories with rapid calibration. Magn Reson Med. 2019 Sep;82(3):1101-1112. doi: 10.1002/mrm.27801.
140. Deelchand DK, Berrington A, Noeske R, Joers JM, Arani A, Gillen J, Schär M, Nielsen JF, Peltier S, Seraji-Bozorgzad N, Landheer K, Juchem C, Soher BJ, Noll DC, Kantarci K, Ratai EM, Mareci TH, Barker PB, Öz G. Across-vendor standardization of semi-LASER for single-voxel MRS at 3T. NMR Biomed. 2019 Dec 18:e4218. doi: 10.1002/nbm.4218. PMID: 31854045
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142. \*Guo S, Fessler JA, Noll DC. High-Resolution Oscillating Steady-State fMRI using Patch-Tensor Low-Rank Reconstruction. IEEE Trans Med Imaging. 2020 Dec;39(12):4357-4368. doi: 10.1109/TMI.2020.3017450.
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144. \*Lu N, Hall TL, Choi D, \*Gupta D, Daou BJ, Sukovich JR, Fox A, Gerhardson TI, Pandey AS, Noll DC, Xu Z. Transcranial MR-guided Histotripsy System. IEEE Trans Ultrason Ferroelectr Freq Control. 2021 Mar 23. doi: 10.1109/TUFFC.2021.3068113. Online ahead of print. PMID: 33755563
145. \*Luo T, Noll DC, Fessler JA, Nielsen JF. Joint Design of RF and Gradient Waveforms via Auto-differentiation for 3D Tailored Excitation in MRI. IEEE Trans Med Imaging. 2021 Dec;40(12):3305-3314. doi: 10.1109/TMI.2021.3083104. Epub 2021 Nov 30. PMID: 34029188
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147. \*Wang G, \*Luo T, Nielsen JF, Noll DC, Fessler JA. B-Spline Parameterized Joint Optimization of Reconstruction and K-Space Trajectories (BJORK) for Accelerated 2D MRI. IEEE Trans Med Imaging. 2022 Sep;41(9):2318-2330. doi: 10.1109/TMI.2022.3161875. Epub 2022 Aug 31. PMID: 35320096; PMCID: PMC9437126.
148. Wang NC, Noll DC, Srinivasan A, Gagnon-Bartsch J, Kim MM, Rao A. Simulated MRI Artifacts: Testing Machine Learning Failure Modes. BME Front. 2022 Nov 1;2022:9807590. doi: 10.34133/2022/9807590. PMID: 37850164; PMCID: PMC10521705.
149. \*Gupta D, Choi D, Lu N, Allen SP, Hall TL, Noll DC, Xu Z. Magnetic Resonance Thermometry Targeting for Magnetic Resonance-Guided Histotripsy Treatments. Ultrasound Med Biol. 2023 Feb 18:S0301-5629(22)00672-X. doi: 10.1016/j.ultrasmedbio.2022.12.009. PMID: 36801181. PMCID: PMC10938365
150. \*Wang G, Nielsen JF, Fessler JA, Noll DC. Stochastic optimization of three-dimensional non-Cartesian sampling trajectory. Magn Reson Med. 2023 Aug;90(2):417-431. doi: 10.1002/mrm.29645. Epub 2022 Apr 17. PMID: 37066854.
151. \*Xiang H, Fessler JA, Noll DC. Model-based reconstruction for looping-star MRI. Magn Reson Med. 2024 Jan 28. doi: 10.1002/mrm.29927. Epub ahead of print. PMID: 38282253.

152. \*Guo S, Fessler FA, Noll DC. Manifold Regularizer for High-Resolution fMRI Joint Reconstruction and Dynamic Quantification. IEEE Trans Med Imaging. 2024 Mar 25. doi: 10.1109/TMI.2024.3381197. Epub ahead of print. PMID: 38526890.

### **Peer-Reviewed Invited Papers and Reviews:**

153. Noll DC. Methodological considerations for spiral k-space functional MRI. International Journal of Imaging Systems and Technology, 6:175-183, 1995.
154. \*Haskell MW, Nielsen JF, Noll DC. Off-resonance artifact correction for MRI: A review. NMR Biomed. 2023 May;36(5):e4867. doi: 10.1002/nbm.4867. Epub 2022 Dec 14. PMID: 36326709.

(\* - graduate student or post-doctoral trainee being advised or co-advised on project)

### **Book Chapters and Other Publications:**

1. Casey BJ, Cohen JD, Noll DC, Schneider W, Rapoport JL. Functional Magnetic Resonance Imaging. in Bigler ED (Ed.), Neuroimaging II: Clinical Applications (pp. 299-329), Plenum Press, New York, 1996.
2. Noll DC, Stenger VA, Vazquez AL, Peltier SJ. Spiral Scanning in Functional MRI. in Moonen CTW, Bandettini PA (Eds.), Medical Radiology: Functional MRI. Springer-Verlag, Heidelberg, pp.149-160, 1999.

### **Conference and Workshop Papers:**

1. Nishimura DG, Noll DC, Glover GH, Macovski A. Partial K-space reconstruction for magnetic resonance angiography by selective inversion recovery. in Proc of the Ann International Conference of IEEE EMBS, 11:593-596, November 9-12, 1989.
2. Noll DC, Pauly JM, Nishimura DG, Macovski. MR reconstruction from projections using half the data. in Medical Imaging V: Image Physics, R.H. Schneider, Ed., Proc. SPIE, 1443:29-36, 1991.
3. Noll DC, Schneider W. Theory, Simulation, and Compensation Strategies of Physiological Motion Artifacts in Functional MRI. in Proc of the IEEE International Conf on Image Processing, 3:40-44, November 13-16, 1994.
4. Noll DC. What makes functional MRI work? in Proceedings of the 27th Symposium on the Interface, Computing Science and Statistics. 27:181-186, 1996.
5. Eddy WF, Fitzgerald M, Genovese C, Mockus A, Noll DC. Functional Image Analysis Software - Computational Olio. in COMPSTAT, Proceedings in Computational Statistics, 12th Symposium, Physica-Verlag, pp. 39-49, 1996.
6. Noll DC, Boada FE. Spectrally selective k-space for high-speed chemical shift imaging. in Syllabus for Workshop on Minimum MR Data Acquisition Methods: Making More with Less, Marco Island, Florida, October 20, 2001, pp. 3-6.
7. \*Sutton BP, Noll DC, Fessler JA. Simultaneous Estimation of Image and Inhomogeneity Field Map. in Syllabus for Workshop on Minimum MR Data Acquisition Methods: Making More with Less, Marco Island, Florida, October 20, 2001, pp. 15-18.
8. \*Sutton BP, Noll DC, Fessler JA. Fast, Iterative, Field-corrected image reconstruction for MRI. in 2002 IEEE International Symposium on Biomedical Imaging. Washington, DC, July 7-10, 2002, paper TP-CS-1.2.
9. Noll DC. Rapid MR image acquisition in the presence of background gradients. in 2002 IEEE International Symposium on Biomedical Imaging. Washington, DC, July 7-10, 2002, paper WA-SS-1.4.

10. \*Martinez FM., Noll DC, Anderson DJ. Magnetic Resonance Compatibility of Multichannel Silicon Microelectrode Systems for Neural Recording and Stimulation in the Central Nervous System. Proceedings of the 1st International IEEE EMBS Conference on Neural Engineering. Capri Island, Italy. March 20-22, 2003. pp. 157-160.
  11. Noll DC. Technical challenges in functional neuroimaging. In 2004 IEEE International Symposium on Biomedical Imaging, Arlington, VA, April 15-18, 2004, pp. 1208-1211.
  12. Noll DC, \*Vazquez A. Contrast mechanisms and acquisition methods in functional MRI. In Proceedings of the 26<sup>th</sup> Annual International Conference of the IEEE EMBS, San Francisco, Sept. 1-5, 2004, pp. 5219-5222.
  13. Fessler JA, Noll DC. Iterative image reconstruction in MRI with separate magnitude and phase regularization. In 2004 IEEE International Symposium on Biomedical Imaging, Arlington, VA, April 15-18, 2004, pp. 209-212.
  14. \*Olafsson V, Fessler JA, Noll DC. Spatial resolution analysis of iterative image reconstruction with separate regularization of real and imaginary parts. In Proc. IEEE Intl. Symp. Biomed. Imag. (ISBI), paper no. TH-PM-PS1.2, 2006.
  15. Fessler JA, Yeo D, Noll DC. Regularized fieldmap estimation in MRI. In Proc. IEEE Intl. Symp. Biomed. Imag., pp. 706–9, 2006.
  16. Funai, A, Fessler JA, Grissom W, Noll DC. Regularized B1+ estimation in MRI. In Proc. IEEE Intl. Symp. Biomed. Imag. (ISBI), paper no. FR-PM-OS6a.4, 2007.
  17. Fessler JA, Noll DC. Model-based MR image reconstruction with compensation for through-plane field inhomogeneity. In Proc. IEEE Intl. Symp. Biomed. Imag. (ISBI), paper no. SA-AM-AA1a.3, 2007.
  18. Peltier SJ, Lisinski JM, Noll DC, LaConte SM. Support vector machine classification of complex fMRI data. Conf Proc IEEE Eng Med Biol Soc (EMBS). 2009:5381-4, 2009.
  19. Bagher-Ebadian H, \*Nejad-Davarani SP, Ali MM, Brown S, Makki M, Jiang Q, Noll DC, and Ewing JR, Magnetic Resonance Imaging Estimation of Longitudinal Relaxation Rate Change ( $\Delta R1$ ) in Dual Gradient Echo Sequences Using an Adaptive Model, IEEE-IJCNN, 2011: 515 (140): 2501-2506. PMC 978-1-4244-9636-5.
  20. \*Zhao, F, Fessler JA, Wright SM, Rispoli JV, Noll DC. Optimized linear combinations of channels for complex multiple-coil B1 field estimation with Bloch-Siegert B1 mapping in MRI. In 2013 IEEE 10th International Symposium on Biomedical Imaging (pp. 942-945), April 2013.
  21. \*Weller DS, Noll DC, Fessler JA. Prospective Motion Correction for Functional MRI Using Sparsity and Kalman Filtering. Proc. SPIE Wavelets and Sparsity XV, Aug. 2013.
  22. Lin CY, Noll DC, Fessler JA, A Temporal Model for Task-Based Functional MR Images, Proceedings - International Symposium on Biomedical Imaging. April 2020, 1035-1038.
- (\* - graduate student or post-doctoral trainee being advised or co-advised on project)

### **Abstracts and Short Conference Proceedings:**

Prof. Noll does not maintain a list of published conference abstracts and short proceedings (estimated # > 500).

### **Patents:**

1. Noll DC. U.S. Patent No. 5,243,284. Method of magnetic resonance imaging from projections using partial data collected in k-space, 1993.
2. Pelc NJ, Noll DC, Pauly JM. U.S. Patent No. 5,257,626. Method of noninvasive myocardial motion analysis using bidirectional motion integration in phase contrast MRI maps of myocardial velocity, 1993.
3. Noll DC, Pauly JM, Macovski A. U.S. Patent No. 5,311,132. Method of enhancing the focus of magnetic resonance images, 1994.

4. Sun H, Nielsen JF, Noll DC. U.S. Patent No. 9,791,530. Method of MRI imaging using non-slice selective, spatially tailored tip-up pulse, 2017.
5. Sun H, Nielsen JF, Noll DC, Fessler JA. U.S. Patent No. 10,247,801. Method of MRI imaging using a spectrally tailored pulse, 2019.
6. Xu Z, Noll DC, and Hall TL. U.S. Provisional Patent Application No. 63/077,440. Transcranial MR-guided histotripsy systems and methods, 2020.
7. Fessler JA, Noll DC, Wang G. U.S. Provisional Patent Application No. 63/301,944. Systems and methods for accelerated magnetic resonance imaging (MRI) reconstruction, 2022.

## **PROFESSIONAL ACTIVITIES**

### **Invited Seminars, Addresses, and Talks:**

1. An Introduction to MRI and its Applications. Invited speaker, Pittsburgh Instrumentation and Analysis Society. Pittsburgh, PA. June 10, 1993.
2. Identifying functionally important areas of the brain using MRI. Invited speaker, Forum on Medical Robotics and Computer Assisted Surgery. Shadyside Hospital, Pittsburgh, PA. June 12, 1993.
3. Imaging of brain function using MRI: An analysis of artifacts. Invited speaker, Electrical Engineering Graduate Seminar Series. University of Illinois, Urbana-Champaign. October 27, 1994.
4. Theory, Simulation, and Compensation Strategies of Physiological Motion Artifacts in Functional MRI. Invited speaker, 1994 IEEE Int. Conf. on Image Processing. Austin, TX. November 16, 1994.
5. Functional MRI - Methods for Image Acquisition and Artifact Correction. Invited speaker, Depts. of Radiology and Clinical Psychology, University of Florida, Gainesville. February 8, 1995.
6. High Performance Computing in Functional MRI: Image Reconstruction and Registration. Invited speaker, The Second Workshop on Advanced Computing in Biological Imaging, The National Center for Supercomputing Applications and The Beckman Institute, University of Illinois, Urbana-Champaign. April 29, 1995.
7. What makes functional MRI work? Invited speaker, Interface '95 - 27th Symposium on the Interface: Computing Science and Statistics. Pittsburgh, PA. June 22, 1995.
8. Biomedical imaging. Invited speaker, Electrical Engineering Undergraduate Seminar Series. University Pittsburgh, Pittsburgh, PA. November 13, 1995.
9. Magnetic resonance imaging. Invited speaker, Bioengineering Undergraduate Seminar Series. University Pittsburgh, Pittsburgh, PA. March 19 and 26, 1996.
10. K-space traversal patterns. Invited faculty, Mini-categorical course on Echo-planar imaging, Fourth Scientific Meeting, Int. Society of Magnetic Resonance in Med., New York, NY. May 1, 1996.
11. Movement correction in functional MRI. Invited speaker, Fifth Annual Little Rock Workshop on Advances in NMR Engineering. Lake Raystown Resort, PA, May 19-21, 1996.
12. Theoretical Issues in Data Analysis. Invited panelist, fMRI2Day Workshop - Satellite workshop of the 2nd International Conf. on Functional Mapping of the Human Brain, Boston, MA, June 17, 1996.
13. Magnetic resonance imaging. Invited speaker, Bioengineering Undergraduate Seminar Series. University Pittsburgh, Pittsburgh, PA. April 1 & 8, 1997.
14. Development of Standards for fMRI. Invited speaker, MR Engineering Study Group Meeting, Fifth Scientific Meeting, Int. Society of Magnetic Resonance in Med., Vancouver, BC. April 15, 1997.

15. Movement correction in functional magnetic resonance imaging. Invited speaker, Workshop on Statistics in the Health Sciences, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN, July 16, 1997.
16. Simultaneous multislice acquisitions using rosette trajectories (SMART): A new imaging method for fMRI. Invited speaker, Graduate Seminar Series, Department of Biophysics, Medical College of Wisconsin, Nov. 7, 1997.
17. Functional MRI - Applications and New Developments in Image Acquisition. Visiting Professor, Department of Radiology, University of Illinois at Chicago, Feb. 4, 1998.
18. Temporal dynamics in functional MRI. Invited speaker, Biomedical Engineering Graduate Seminar Series. University Michigan, Ann Arbor, MI. December 7, 1998.
19. EPI Overview. Invited Faculty, Eighth Annual Meeting, Soc. of Magnetic Resonance Technologists, Philadelphia, May 22, 1999.
20. The physiological origins of non-linearities in the BOLD response. Invited speaker, Graduate Seminar Series, Department of Biophysics, Medical College of Wisconsin, Sept. 10, 1999.
21. Fast scan sequences for functional MRI. Invited speaker, Biomedical Imaging Symposium: Beyond Diagnostics, University of Michigan, Sept. 18, 1999.
22. Technical issues in functional MRI. Invited speaker, Methods in Cognitive Neuroscience Seminar, Department of Psychology, University of Michigan, Sept. 29, 1999.
23. Functional MRI: Noise and Resting State Activity. Invited speaker, Biomedical Engineering Seminar Series, University of Illinois at Chicago. September 7, 2001.
24. Role of parallel imaging in high field fMRI. Invited speaker, 9<sup>th</sup> Annual Meeting of the Organization for Human Brain Mapping, June 21, 2003.
25. Temporal BOLD Characteristics. Invited speaker, 11<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Toronto. July 10, 2003.
26. Gridding procedures for non-Cartesian k-space trajectories. Invited speaker, 11<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Toronto. July 10, 2003.
27. Advances in MRI. Invited speaker, Workshop on Medical Imaging Analysis, 25th Ann. Int. Conf. of IEEE EMBS, Cancun, Mexico, September 17, 2003.
28. Better images of the working brain. Invited speaker, Smithgroup Distinguished Lecture, Beckman Institute, University of Illinois, Urbana-Champaign, October 10, 2003.
29. Technical Challenges in Neuroimaging. Invited speaker, 2004 IEEE International Symposium on Biomedical Imaging. Arlington, VA, April 17, 2004.
30. Temporal BOLD Characteristics. Invited speaker, 12<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Kyoto. May 15, 2004.
31. Artifacts...and correction strategies in fMRI. Invited speaker, 12<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Kyoto. May 20, 2004.
32. fMRI Acquisition. Invited speaker. Graduate Summer School: Mathematics in Brain Imaging. Institute for Pure and Applied Mathematics, UCLA. July 19, 2004.
33. Better images of the thinking brain: The challenges of magnetic susceptibility. Bioengineering Seminar Series, Yale University, December 1, 2004.
34. Better images of the thinking brain: The challenges of magnetic susceptibility. Biophysics Seminar Series, Medical College of Wisconsin, January 14, 2005.
35. Linearity of the fMRI response: Implications for paradigm design. Invited speaker, 13<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Miami. May 8, 2005.

36. Gridding for non-Cartesian k-space sampling. Invited speaker, 13<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Miami. May 8, 2005. [Recipient of an Outstanding Teacher Award from the ISMRM]
37. Better Images of the Thinking Brain: The Challenge of Magnetic Susceptibility. Medical Physics Seminar Series. University of Wisconsin. December 5, 2005.
38. Better Images of the Thinking Brain: The Challenge of Magnetic Susceptibility. Frontiers in Biomedical Imaging Seminar Series, Case Western Reserve University. April 17, 2006.
39. MR Physics: What you need to know to talk to your physicist. Invited speaker, 2006 Annual Meeting of the Organization for Human Brain Mapping, Florence, Italy. June 11, 2006.
40. Better Images of the Thinking Brain: Advances in Image Reconstruction and Motion Correction. University of Pittsburgh Department of Radiology Grand Rounds. August 3, 2006.
41. RF pulse design for transmit SENSE. Invited speaker, 14<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Seattle. May 11, 2006. [Recipient of an Outstanding Teacher Award from the ISMRM]
42. Better Images of the Thinking Brain: Advances in Image Reconstruction and Motion Correction. Department of Imaging Physics Seminar, MD Anderson Cancer Center, Houston, TX. February 13, 2007.
43. Reconstruction from non-Cartesian k-space sampling. Invited speaker, Joint annual meeting ISMRM-ESMRMB 2007, Berlin, May 20, 2007. [Recipient of an Outstanding Teacher Award from the ISMRM]
44. Parallel transmission. Plenary speaker, Joint annual meeting ISMRM-ESMRMB 2007, Berlin, May 24, 2007.
45. MR Physics: What you need to know to talk to your physicist. Invited speaker, 2007 Annual Meeting of the Organization for Human Brain Mapping, Chicago, IL. June 10, 2007.
46. Advances in Functional Magnetic Resonance Imaging. Invited speaker, University of Pittsburgh Bioengineering Department. October 25, 2007.
47. Parallel Excitation. Invited speaker. Lauterbur Memorial Symposium, University of Illinois, Urbana-Champaign. March 28, 2008.
48. Advances in Image Reconstruction and Motion Correction. Invited speaker. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, April 23, 2008.
49. Better Images of the Thinking Brain. Department of Biomedical Engineering Seminar, University of Minnesota. October 27, 2008.
50. Better Images of the Thinking Brain. Department of Biomedical Engineering Seminar, University of Virginia. November 7, 2008.
51. Standard methods for reconstructing arbitrarily sampled data. Invited speaker. Data Sampling and Image Reconstruction, Sedona, AZ, January 25-28, 2009.
52. Approaches to Reduce Magnetic Susceptibility Artifact in Functional MRI. Invited speaker. BMES Annual Meeting, Pittsburgh, October 7-10, 2009.
53. Consensus Panel: Unsolved Problems in Parallel Transmission. Invited panelist. ISMRM Third International Workshop of Parallel MRI, Santa Cruz, CA, October 23-26, 2009.
54. Better Images of the Thinking Brain. Department of Biomedical Engineering Seminar, University of California - Irvine. December 11, 2010.
55. Better Images of the Thinking Brain. Department of Biomedical Engineering Seminar, Texas A&M University. February 13, 2012.
56. Bloch Equation in the Rotating Frame, Excitation and Multidimensional Excitation. Invited speaker for Educational Program on MR Physics for Physicists, International Society for Magnetic Resonance in Medicine Annual Meeting, Milan Italy, May 10, 2014.
57. Better Images of the Thinking Brain. Department of Biomedical Engineering Seminar, Cornell University. October 15, 2015

58. RF Pulse Design. Invited speaker for Educational Program on Image Acquisition & Reconstruction, International Society for Magnetic Resonance in Medicine Annual Meeting, Singapore, May 8, 2016.
59. Better and Faster Images of the Thinking Brain. Department of Bioengineering/Beckman Institute, University of Illinois-Urbana Champaign. November 21, 2016.
60. Better and Faster Images of the Thinking Brain. Department of Biomedical Engineering, Purdue University. October 25, 2017.
61. Better and Faster Images of the Thinking Brain. Lauterbur Lecture in MRI, Department of Radiology, Case Western Reserve University. November 7, 2017.
62. Human-Designed, Physics-Based Image Reconstruction in MRI. Invited speaker. In Vivo MR Gordon Research Seminar. July 15, 2018.
63. Better and Faster Images of the Thinking Brain. Vanderbilt University Institute for Imaging Science. September 13, 2019.

#### **Sessions Chaired, Courses and Programs Organized:**

1. Functional MR imaging - Models and mechanisms. Session chair, Fourth Scientific Meeting, Int. Society of Magnetic Resonance in Med., New York, NY. May 1, 1996.
2. Functional MR imaging - Models and mechanisms. Session chair, Fifth Scientific Meeting, Int. Society of Magnetic Resonance in Med., Vancouver, BC. April 15, 1997.
3. Functional MR imaging - Modeling and data analysis. Session chair, Sixth Scientific Meeting, Int. Society of Magnetic Resonance in Med., Sydney. April 21, 1998.
4. fMRI Acquisition Methods. Session chair, 8<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Denver. April 3, 2000.
5. fMRI: Noise Processes and Signal Recovery. Session chair, 9<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Glasgow. April 25, 2001.
6. fMRI Susceptibility Artifact Reduction and Sensitivity Enhancement. Session chair, 10<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Honolulu. May 21, 2002.
7. Weekend Educational Program. Chair of weekend program with 8 courses, 10<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Honolulu. May 18-19, 2002.
8. (Bio)Physics of fMRI. Educational session chair, 8<sup>th</sup> Int. Conf. on Functional Mapping of the Human Brain, June 2, 2002.
9. Imaging Techniques. Oral session chair, 8<sup>th</sup> Int. Conf. on Functional Mapping of the Human Brain, June 4, 2002.
10. MR Reconstruction. Session chair, 2002 IEEE International Symposium on Biomedical Imaging. Washington, DC, July 9, 2002.
11. Brain function and fMRI. Course organizer, 11<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Toronto. July 10-11, 2003.
12. Brain function and fMRI. Course organizer, 12<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Kyoto. May 15-16, 2004.
13. fMRI Imaging Techniques. Session chair, 12<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Kyoto. May 20, 2004.
14. Magnetic Resonance Imaging Workshop, Course organizer, 26<sup>th</sup> Annual Meeting of IEEE EMBS, San Francisco, September 1, 2004.
15. Functional Neuroimaging, Mini symposium organizer and speaker, 26<sup>th</sup> Annual Meeting of IEEE EMBS, San Francisco, September 4, 2004.



16. Transmit SENSE and RF pulses. Session chair, 13<sup>th</sup> Scientific Meeting, Int. Society of Magnetic Resonance in Med., Miami. May 9, 2005.
17. Parallel transmission. Session chair, Joint annual meeting ISMRM-ESMRMB 2007, Berlin, May 24, 2007.
18. ISMRM Workshop on Data Sampling and Image Reconstruction. Program committee and session chair, Sedona, AZ, January 25-28, 2009.
19. Functional MR Imaging. Session co-chair. BMES Annual Meeting, Pittsburgh, October 7-10, 2009.
20. Modeling & Quantitative Analysis for Body DCE MRI, Session co-chair, ISMRM-ESMRM 2010, Stockholm, May 4, 2010.
21. The Eye of the Beholder: An Image Reconstruction Challenge, Plenary Session co-organizer and panelist, ISMRM-ESMRM 2010, Stockholm, May 5, 2010.
22. How to Perform a Multi-Site Neuroimaging Study, Session co-organizer and chair. ISMRM-ESMRM 2010, Stockholm, May 5, 2010.
23. ISMRM Workshop on Data Sampling and Image Reconstruction. Program committee and session chair, Sedona, AZ, February 3-6, 2013.
24. Biomedical Engineering Society (BMES) Annual Meeting, Optics and Imaging Track, Co-Chair, San Antonio, TX, October 22-25, 2014.
25. ISMRM Workshop on Data Sampling and Image Reconstruction. Program committee and session chair, Sedona, AZ, January 17-20, 2016.
26. RF Pulse Design. Session chair, Annual Meeting of the ISMRM, Singapore, May 12, 2016.
27. Neuro Acquisition: Seeing the CNS Better, Session chair, Annual Meeting of the ISMRM, Paris, June 19, 2018.

## **RESEARCH SUPPORT**

### **Active Grants and Contracts:**

1. PI, High SNR Functional Brain Imaging using Oscillating Steady State MRI, NIH 1U01EB026977-01, 09/30/2018 – 06/30/2024, TC \$2,799,709.
2. Co-I (Z. Xu, PI), Transcranial magnetic resonance guided histotripsy (TcMRgHt), NIH 1R01EB028309-01, 08/01/2019-04/30/2023, TC \$2,363,399.
3. NeuroImaging Core Co-Lead (H. Paulson, PI), Michigan Alzheimer's Diseases Research Center, NIH 1P30AG072931-01, 09/01/21-05/30/26, TC \$15,381,397.
4. Co-I (J.-F. Nielsen, PI), A harmonized vendor-agnostic environment for multi-site functional MRI studies, 1U24NS120056-01, 9/15/21- 8/31/26, TC \$3,474,266.
5. PI, Novel methods for dynamic MRI of gastrointestinal motor function, 1R21EB034344-01A1, 1/15/2024-1/6/2025, TC \$386,100.
- 6.

### **Past Grants and Contracts (PI):**

1. Co-PI (JD Cohen, PI and Co-PI's WF Eddy, N Goddard), Computational and statistical methods for the analysis of neuroimaging data sets, NSF IBN-9418982, 1995-1996, TC 132,825.
2. PI, Optimized MRI for functional brain mapping, The Whitaker Foundation, 04/01/94-03/31/97 TC 179,995.
3. PI, High-resolution, spiral k-space MR imaging of brain function, NIH RO1-NS-32756-01, 9/05/94-5/15/98 TC 451,106.
4. PI, Optimized MRI for functional brain mapping: Head movement, The Whitaker Foundation, 8/1/97-7/31/98, TC 69,547.

5. PI (with Co-PI CR Genovese) Statistical methods for the analysis of functional MRI data, Center for the Neural Basis of Cognition (R.K. Mellon Foundation), 1995-1998 DC 29,930.
6. Co-PI, 0% effort, (J Jonides, PI), Acquisition of Magnetic Resonance Imaging Scanner for Functional Studies, NSF BCS-9977521, 9/1/99-8/31/02, TC 1,175,680.
7. PI, 0% effort, Quantitative mapping of functional brain activity using MRI, Raynor Foundation, 3/23/01-3/23/03, TC \$60,000.
8. PI, 25% effort, Rapid, whole-brain functional MR imaging, NIH RO1 NS-32756-04A1, 5/15/98-1/31/04, TC 907,908.
9. PI, 0% effort, The BME Industrial Internship Program at Michigan, The Whitaker Foundation, TC 179,958, 5/01/03-4/31/06.
10. PI (20% effort), Signal Recovery in Susceptibility Based Functional MRI, NIH 1 R01 DA15410-01, 09/10/2002-06/30/2008, TC \$1,510,899.
11. PI (27% effort), Elimination of Head Movement Artifact in fMRI, NIH 1 R01 EB02683-01, 09/01/2003 - 07/31/2008, TC \$1,789,390.
12. PI (0% effort), Small Bore 7T Magnetic Resonance Instrument, NIH 1 S10 RR22974-01, 06/01/2007 - 05/31/2010, TC \$1,900,000.
13. PI, GAANN Fellowships in the Department of Biomedical Engineering at the University of Michigan , Department of Education, 08/14/2006-08/13/2009, TC \$510,908.
14. PI, MR Parallel Excitation for Neuroimaging Applications, NIH 1 R01 NS058576-01, 01/01/2008 - 12/31/2014, TC \$3,052,098.
15. PI, GAANN Fellowships in the Department of Biomedical Engineering at the University of Michigan, Department of Education P200A090070, 08/14/2009 – 08/13/2012, TC \$391,968.
16. PI, MRI Scanner for Functional Brain Imaging, 1S10OD012240-01A1, 07/15/2012 – 07/14/2015, \$2,000,000.
17. PI (B Foerster, co-PI), Improved MRI of the Cranial Nerves, UM-Coulter Translational Research Partnership, 07/01/2014-09/30/2016, \$102,710.
18. PI, GAANN Fellowships in the Department of Biomedical Engineering at the University of Michigan , Department of Education P200A120145, 08/16/2012 - 08/15/2016, TC \$408,315.
19. PI, Upgrade for MRI Instrument for Functional Brain Imaging, 1S10OD026738-01, 09/19/2019 – 09/18/2021, TC \$1,750,000.
20. PI (DC Noll and J Fessler, MPI), Fast Functional MRI with Sparse Sampling and Model-Based Reconstruction, NIH 1R01EB023618-01, 03/01/2017 – 12/18/2023, TC \$1,322,390.
21. PI (DC Noll and J Fessler, MPI), Fast Functional MRI R01– Administrative Supplement, NIH 1R01EB023618-02W1, 09/24/2018 – 12/18/2023, TC \$138,596.

**Past Grants and Contracts (Co-Investigator and other roles):**

1. Co-I, (KR Thulborn, PI), Enhanced computer environment for functional imaging, NIH, 12/1/95-11/30/96, TC 100,000.
2. Core Director (KR Thulborn, PI), Computational and Statistical Processing Core, Functional and Physiological Mapping of the Human Brain, NIH P01-NS35949-01, 9/1/97-05/31/02. (Role ended 5/31/98).
3. Co-I, (JD Cohen, PI), Functional MRI studies of the function and organization of prefrontal cortex, NIMH R01-MH52864-01, 4/1/96-3/31/00, TDC 710,444 (est). (Role ended 6/30/98 on Dr. Cohen's departure from Univ. of Pittsburgh).
4. Co-I, (W Schneider, PI), Mapping human attentional & memory control with FMRI, NIH RO1-HD32395-01A1, 2/1/95-1/31/99 TDC 860,000. (Role ended 11/30/98 on departure from Univ. of Pittsburgh).

5. Consultant (W Schneider, PI), Brain imaging of human skill acquisition and workload processing, ONR, 7/1/95-12/30/98, TDC 362,126. (Role ended 11/30/98 on departure from Univ. of Pittsburgh).
6. Co-I (N Ryan, PI; BJ Casey, Project PI), The psychobiology of childhood anxiety and depression, NIH P01-41712-10, 10/1/96-6/30/01. (Role ended 11/30/98 on departure from Univ. of Pittsburgh).
7. Co-I (KR Thulborn, PI), Enhanced gradient performance for functional MR imaging, NIH S10-RR12016-01, 12/1/96-11/30/97, TC 100,000. (Role ended 11/30/98 on departure from Univ. of Pittsburgh).
8. Co-Investigator (JD Cohen, PI), Advanced Methods for Neuroimaging Data Analysis, NIH, RO1-DA/MH11469-01, 8/1/97-7/31/00.
9. Consultant (SL Small, PI), Functional neuroanatomy of normal and impaired language, NIH R01-DL02621-01, 7/1/96-6/30/01.
10. Co-I, (SL Small, PI), Functional MRI of motor recovery in stroke, NIH R01-NS35267-01, 12/1/96-11/30/01.
11. Co-I, 5% effort, (B Kim, PI), Enhanced Detection of fMRI Signals via Motion Correction, NIH R01 EB000309, 07/01/00-06/30/03, TC \$809,749.
12. Co-I, 8.25% effort, (D Park, PI), Imagery Visual Memory & aging: A NeuroImaging approach, NIH R01AG006265. (Role ended when PI left the University of Michigan).
13. Co-I, 4.1% effort, (J Jonides, PI), Executive processes: Behavioral and Neuroimaging Studies, NIH R01 MH060655, 07/01/00-06/30/05, TC \$1,664,096.
14. Co-I, 4.1% effort, (P Reuter-Lorenz, PI), Neurocognitive Aging of Working Memory Storage and Executive Processes, NIH R01 AG018286, 08/01/00-07/31/05, TC \$1,576,059.
15. Co-I, 0% effort (J Grotberg, PI), NASA Bioscience and Engineering Institute, 9/1/03-8/31/07, TC approximately \$4,000,000.
16. Co-I, 5% effort (S Taylor, PI), Neuroanatomy of Emotion in Treatment Resistant Psychosis, NIH R01 MH64148-01, 7/01/02 - 6/30/08, TC \$1,754,916.
17. Co-I, 5% effort (L Hernandez-Garcia, PI), Fast, Quantitative Perfusion-Based functional MRI, 1 R01 EB004346-01, 7/1/2005-6/30/2008, TC \$593,348.
18. Co-I, 2.5% effort (R Seidler, PI), Skill Acquisition in Older Adults, NIH R01 NS045208-01, 8/15/05-8/14/09, TC \$1,194,100.
19. Co-I, 8.25% (J Jonides, PI), Training in Functional Magnetic Resonance Imaging, NIH R25 MH071279-01, 07/01/05-06/30/10, TC \$721,644.
20. Co-I, 5% effort (R Zucker, PI), Neurocognitive Risk for Alcoholism into Adulthood, NIH R01 AA012217-06, 9/20/2005-6/30/2010, TC \$2,606,356.
21. Co-I (B Cimprich, PI), Altered Brain Function in Chemotherapy for Breast Cancer, NIH R01NR010939-01A2, 02/15/2008-01/31/2013, TC \$1,825,297.
22. Co-I (Shanley), Michigan Institute for Clinical and Health Research (MICHR). NIH 5UL1RR024986-02, 09/17/2007 – 05/31/2012, TC \$54,589,564.
23. Co-I (Zubieta/Peltier/Greenwald, MPI's), Development and Use of rtfMRI for Self-Control of Nicotine Craving, NIH R21/R33 DA026077-01, 09/01/2008 – 08/31/2013, TC \$2,261,765.
24. Co-I (Zucker/Heitzig), Brain Endophenotypes Modulating Drug Abuse Risk, NIH 1R01DA02726101, 7/01/2009 – 06/30/2014, TC \$3,264,330.
25. Co-I (J Jonides, PI), Training in Functional Magnetic Resonance Imaging, NIH R25 MH071279-06, 09/01/11-08/31/15, TC \$829,985.
26. Co-I (J Balter, PI), Optimizing MRI for Radiation Therapy Treatment Planning, NIH 1R01EB01607901-A1, 04/01/2013 – 03/31/2017, TC \$1,661,784.00.

27. Co-I (L Hernandez-Garcia, PI), Quantitative blood flow imaging using Spin Labeled MR Fingerprinting, NIH 1-R21-EB-021562-01, 3/1/2016-12/31/2017, TC \$400,285.
28. Co-I (Z. Xu, PI), Transcranial histotripsy for treatment of brain tumors - Initial In vivo Pig Study, Focused Ultrasound Surgery Foundation, 8/1/2019-12/31/2020, TC \$122,809.
29. Co-I (J Jonides, PI), Training in Functional Magnetic Resonance Imaging, NIH R25 MH071279-11, 09/01/15-08/31/22, TC \$1,013,070.
30. Co-I (N. Seiberlich, PI), Exploration of Ultrasound-Activated Bubbles as a Switchable MRI Contrast Agent, NIH 1R21EB030208-01, 6/1/2020-3/31/2022, TC \$448,193.

## **TEACHING**

### **Formal Courses:**

Classes taught at University of Michigan:

BME 295, Seminar in Biomedical Engineering, University of Michigan, Winter Term 2000.

BME 311 (formerly BME 499), Biomedical Signals and Systems [new course developed], Winter Term, 2004-05

BME 450, Senior Design, University of Michigan, Winter Term 2021.

BME 483, Introduction to MRI [new course developed], Winter Term 1999-2001.

BME 499/Psych 804, Introduction to Functional MRI, Summer Term, 2001-02, 2004-2012, 2014-2019, 2021-present. (4-12 hours of lecture and lab; with J. Jonides, L. Hernandez, S. Peltier, and others).

EECS 556, Image Processing, Winter Term, 2002-03.

BME 499/BME 241, Biomedical Engineering Laboratory, University of Michigan, F07, W08, W09, W11, W12, W13, F14, W15. [developed and taught a 1 Cr. statistics module for this lab class]

BME 500, Biomedical Engineering Seminar, University of Michigan, F/W 2006-10, F11, W12, F12.

BME 503, Biomedical Engineering Statistics, University of Michigan, Winter Term 2015-2020, 2023-present.

BME/EECS 516, Medical Imaging Systems [extensive set of on-line notes were created], Fall Term 1999-2004, 2006, 2014-2019, 2022-present.

BME 599, Graduate Innovative Design in BME, Winter Term 2022

Classes taught elsewhere:

EE 278, Statistical Signal Processing, Stanford University, Summer Term 1990.

BioE 2393, Medical Imaging Systems (cross-listed as EE 2595, Special Topics in Signal Processing/Communications) [new course developed], University of Pittsburgh, Spring Terms 1994, 1996 and 1998.

### **Supervision/Mentorship of Students:**

M.S. thesis advisees (as chair or co-chair, completed) (4):

Saldju Tadjudin, M.S., Electrical Engineering, University of Pittsburgh, 1992, "Partial k-space reconstruction for magnetic resonance imaging." (Co-advisor: Dr. C.C. Li)

Jennifer O'Brien, M.S., Bioengineering, University of Pittsburgh, 1995, "Characterization of physiological variations in functional magnetic resonance imaging."

Alberto Vazquez, M.S., Bioengineering, University of Pittsburgh, 1997, "Non-linear aspects of the blood oxygenation response in functional magnetic resonance imaging."

Robert Santos, M.S., Bioengineering, University of Pittsburgh, 1999, "A Simulation Study of Magnetic

Susceptibility in Gradient Echo fMRI at 3.0 T.” (Co-advisor: Dr. F.E. Boada)

Current Ph.D. advisees (as chair or co-chair) (4):

Mariama Salifu, Jayden Pothoof, Sofia Kardonik, Rex Fung.

Ph.D. dissertation advisees (as chair or co-chair, completed) (28):

Scott J. Peltier, Ph.D., Applied Physics, University of Michigan, 2003, “Characterization and Compensation of Systematic Noise in Functional Magnetic Resonance Imaging.” Current position: Research Scientist and Technical Director, Functional MRI Laboratory, University of Michigan.

Bradley P. Sutton, Ph.D., Biomedical Engineering, University of Michigan, 2003, “Physics based iterative reconstruction for MRI: Compensating and estimating field inhomogeneity and T2\* relaxation.” (Co-advisor: Dr. J.A. Fessler) Current position: Professor of Bioengineering, University of Illinois, Urbana-Champaign.

Alberto L. Vazquez, Ph.D., Biomedical Engineering, University of Michigan, 2005, “The dynamics of the blood oxygenation response in functional magnetic resonance imaging.” Current position: Associate Professor of Radiology and Bioengineering, University of Pittsburgh.

Francisco Martinez-Santesteban, Ph.D., Biomedical Engineering, University of Michigan, 2006, “Magnetic resonance study of silicon microelectrodes.” (Co-advisor: Dr. D.J. Anderson) Current position: Research Scientist, Western University, New London, ON.

Sangwoo Lee, Ph.D., Electrical Engineering-Systems, University of Michigan, 2006, “Iterative Reconstruction Methods for Rosette Trajectories in Functional MRI.” (Co-advisor: Dr. J.A. Fessler) Current position: Samsung Electronics, Korea.

Gregory R. Lee, Ph.D., Biomedical Engineering, University of Michigan, 2007, “Functional Magnetic Resonance Imaging with Continuous Arterial Spin Labeling: A Novel Pulse Sequence and Quantitative Model.” (Co-advisor: Dr. L. Hernandez-Garcia) Current position: Senior Software Engineer, Quantsight, Inc.

Chun-yu Yip, Ph.D. Electrical Engineering-Systems, University of Michigan, 2007, “RF Pulse Designs for signal recovery in T2\*-weighted Functional Magnetic Resonance Imaging.” (Co-advisor: Dr. J.A. Fessler) Current position: Japan.

William A. Grissom, Ph.D. Biomedical Engineering, University of Michigan, 2008, “Radiofrequency pulse design for parallel excitation in magnetic resonance imaging.” Current position: Professor, Case Western Reserve University.

Kiran K. Pandey, Ph.D. Biomedical Engineering, University of Michigan, 2009, “Mitigation of Motion Artifacts in Functional MRI: A Combined Acquisition, Reconstruction and Post Processing Approach.” Current position: CEO, Emtherapro Inc., Atlanta, GA.

Valur Olafsson, Ph.D. Electrical Engineering-Systems, University of Michigan, 2009, “Fast and Motion Robust Dynamic R2\* Reconstruction for functional MRI.”(Co-advisor: Dr. J.A. Fessler) Current position: Technical Director, Neuroscience Imaging Center, Northeastern University.

Yoon Chung Kim, Ph.D. Biomedical Engineering, University of Michigan, 2010, “Non-Cartesian Parallel Image Reconstruction for Functional MRI” Current position: Scientific Program Manager, Korean government.

Daehyun Yoon, Ph.D. Electrical Engineering-Systems, University of Michigan, 2012, “Fast Joint design of RF and Gradient waveforms for MRI parallel excitation.”(Co-advisor: Dr. J.A. Fessler) Current position: Assistant Professor, UCSF.

Hesam Jahanian, Ph.D. Biomedical Engineering, University of Michigan, 2012, “Functional MRI using pseudo-continuous arterial spin labeling” (Co-advisor: Dr. L. Hernandez-Garcia) Current position: Assistant Professor, University of Washington, Seattle, WA.

Reza Farjam, Ph.D. Biomedical Engineering, University of Michigan, 2013, “Computation Framework for Lesion Detection and Response Assessment Based Upon Physiological Imaging for Supporting Radiation Therapy of Brain Metastases.” (Co-advisor: Dr. Yue Cao) Current position: Assistant Professor, Northwestern

University, Chicago, IL.

- Feng Zhao, Ph.D. Biomedical Engineering, University of Michigan, 2013. “Methods for MRI RF Pulse Design and Image Reconstruction.” (Co-advisor: Dr. J.A. Fessler) Current Position: Google, Mountain View, CA.
- Siamak P. Nejad-Davarani, Ph.D. Biomedical Engineering, University of Michigan, 2014. “Parametric Modeling of the Brain Vascular System and its Application in Dynamic Contrast-Enhanced Imaging Studies.” Current Position: Clinical Assistant Professor, University of Miami.
- Angela R. Harrivel, Ph.D. Biomedical Engineering, University of Michigan, 2014. “Monitoring Attentional State with Functional Near Infrared Spectroscopy.” (Co-advisor: Dr. S.J. Peltier) Current position: NASA Langley Research Center, Hampton, VA.
- Yash S. Shah, Ph.D. Biomedical Engineering, University of Michigan, 2015. “Methods and Applications of Multivariate Pattern Analysis in Functional MRI Data Analysis.” (Co-advisor: Dr. S.J. Peltier) Current position: AppNexus, NYC, NY.
- Alan Chu, M.D., Ph.D. Biomedical Engineering, University of Michigan, 2016. “Simultaneous Multislice Functional Magnetic Resonance Imaging.” Current position: Radiologist, Bellingham, WA.
- Matthew J. Muckley, Ph.D. Biomedical Engineering, University of Michigan, 2016. “Acceleration Methods for MRI.” (Co-advisor: Dr. J.A. Fessler) Current position: Facebook AI Research, New York, NY.
- Kathleen M. (Ropella) Panagis, Ph.D. Biomedical Engineering, University of Michigan, 2017. “Methods for Improving MRI-Based Conductivity Mapping.” Current position: Lecturer III, University of Michigan.
- Sydney N. Williams, Ph.D. Biomedical Engineering, University of Michigan, 2018. “Constrained and Spectral-Spatial RF Pulse Design for Magnetic Resonance Imaging.” (Co-advisor: Dr. J.A. Fessler) Current position: Lecturer, University of Glasgow.
- Amos A. Cao, Ph.D. Biomedical Engineering, University of Michigan, 2019. “Methods for Physiological Artifact Correction in Oscillating Steady State Imaging.” Current position: Scientist, Hyperfine, Inc. Guilford, CT.
- Tianrui Luo, Ph.D. Biomedical Engineering, University of Michigan, 2020. “MRI excitation pulse design and image reconstruction for accelerated neuroimaging.” (Co-advisor: Dr. J.-F. Nielsen) Current position: Scientist, Hyperfine, Inc. Guilford, CT.
- Shouchang Guo, Ph.D. Electrical Engineering and Computer Science, University of Michigan, 2022. “Novel Models for High-Dimensional Imaging: High-Resolution fMRI Acceleration and Quantification.” (Co-advisor: Dr. J.A. Fessler) Current position: Microsoft, Bellevue, WA.
- Michelle Karker, Ph.D. Biomedical Engineering, University of Michigan, 2022. “Predictive Analysis and Deep Learning of Functional MRI in Alzheimer’s Disease.” (Co-advisor: Dr. S.J. Peltier) Current position: Draper Laboratory, Cambridge, Massachusetts.
- Guanhua Wang, Ph.D. Biomedical Engineering, University of Michigan, 2023. “Optimizing Signal Sampling Strategies for Magnetic Resonance Imaging.” (Co-advisor: Dr. J.A. Fessler) Current position: Scientist, QBio, San Carlos, CA.
- Dinank Gupta, Ph.D. Biomedical Engineering, University of Michigan, 2024. “MRI Guidance of Transcranial Histotripsy Treatments.” (Co-advisor: Dr. Z. Xu) Current position: U-M.
- Haowei Xiang, Ph.D. Electrical and Computer Engineering, University of Michigan, 2024. “Advanced Image Reconstruction and Sampling Pattern Optimization in Silent MRI.” (Co-advisor: Dr. J.A. Fessler) Current position: U-M.

Postdoctoral trainees (5):

- V. Andrew Stenger, Ph.D., Research Associate, University of Pittsburgh, 1996-1998. Current position: Professor, University of Hawaii.
- Sumati Krishnan, Ph.D., Research Associate, University of Michigan, 2005-2007.

Daniel S. Weller, Ph.D., Postdoctoral Fellow, University of Michigan, 2012-2014. Funded by NIH F32 grant, co-mentor with Dr. J.A. Fessler. Current position: KLA Tencor, Ann Arbor.

Melissa Haskell, Ph.D., Postdoctoral Fellow, University of Michigan, 2019-2022. Funded by NIH F32 grant, co-mentor with Dr. J.A. Fessler. Current position: Scientist, Hyperfine, Inc. Guilford, CT.

Rodrigo Lobos, Ph.D., Postdoctoral Fellow, University of Michigan, 2023-present. Co-mentor with Drs. Z. Liu and J.A. Fessler.

Thesis/Dissertation committees (as committee member, completed):

University of Pittsburgh:

Ph.D. (6): Jianyu Lian, Leping Zha, David Madio, Darryl S. Breitenstein, Ileana Hancu, Hai Zheng.

M.S. (2): Arthur Johnson, III, Sam Y. Chang.

Carnegie Mellon University:

Ph.D. (2): \*Mark Fitzgerald, Susan Slawson.

University of Michigan:

Ph.D. (58): Feng Yu, \*Christy Marshuetz, Yao Wang, Robinson Piramuthu, Gary Rymar, Amir Ghenei, Srikanth Kidambi, Satoru Hayashi, Wen-Lin Luo, \*Tor Wager, Javier DeAna, Tim Hall, Magnus Ulfarsson, Joonki Noh, Lei Xu, Appagi Panchangam, Ragnar Olafsson, Michael Franklin, Derek Nee, Ted Win Way, Behzad Ebrahimi, Luyen Chen, Aniket Joshi, Beata Chertok, Alexandra Atkins, Ray Maleh, Congxian Jia, Benjamin Lee, Faisal Al Salem, Kim Khalsa, \*Amanda Funai, David Thompson, Seth Koehler, Wonsuk Huh, Antonis Matakos, Shani Ross, Benjamin Hoff, Michael Allison, Jang Hwan Cho, \*Hao Sun, Zachary Irwin, Sven Holcombe, Heekon (Kenny) Cha, Abdulrahman Aref, Gopal Nataraj, Lianli Liu, Josiah Simeth, \*Yilin (Claire) Lin, Anish Lahari, Jonas Schollenberger, Edward Peter Washabaugh, Jiayue Cherry Cao, Yuan Li, Aunnasha Sengupta, Steven Whitaker, \*Nicholas Wang, \*Ning Lu, Jiaren Zou.

M.S. (3): Anne Gu, Sai Abitha Srinivas, Xijia Quan.

Other Institutions: Ph.D. (5): Raoqiong Tong Bennett, Medical College of Wisconsin; Charles Cunningham, University of Toronto; Andrew Nencka, Medical College of Wisconsin; Franz Patzig, ETH Zurich; Chaithya GR (Giliyar Radhakrishnan), Université Paris-Saclay.

\*Co-authorship of peer-reviewed journal articles.

Other student project advisees (MS and undergrad directed research projects, partial listing):

University of Pittsburgh: Jarad Prinkley.

University of Michigan: Srikanth Kidambi, Marc Berman, Dev Ghosh, Jennifer Wells, Will Grissom, Shantanu Dhamija, Vijay Swaminthan, Jaemin Shin, Shiela Kahwati, Kelly Bratic, Hari Bharadwaj, Jun (Martin) Ma, Shouchang Guo.

## SERVICE

### Service to Profession:

#### Editorial Boards:

Magnetic Resonance Imaging, 2001-present.

Magnetic Resonance in Medicine, 2005-2020.

#### Journal Referee:

Magnetic Resonance in Medicine, 1989-1991, 1996-present.

Magnetic Resonance Imaging, 1990, 1997-1998, 2001-present.

IEEE Transactions on Medical Imaging, 1990-present.

Journal of Magnetic Resonance Imaging, 2002-present.

NeuroImage, 1998-2010, 2016-17.

IEEE Transactions on Image Processing, 1994, 1996.

Human Brain Mapping, 1994-1995.

Journal of Magnetic Resonance, 1997-1999, 2002.

Medical Physics, Associate Editor, 2016, 2018.

#### Society Committees:

Biomedical Engineering Council of Chairs

Chair-elect, 2009-2010.

Chair, 2010-2011.

Chair of nominating committee, 2011-2012.

International Society of Magnetic Resonance in Medicine

Governance Committee, MR Engineering Study Group, 1996-1998.

Subcommittee on Student Stipends, 1995-1999 (Chair, 1997-1999).

Ad Hoc Committee on Electronic Communications, 1999-2000.

Education Committee, 2000-2003 (Vice-Chair, 2000-01; Chair, 2001-02).

Safety Committee, 2000-2003 (Chair, 2002-03).

Scientific Program Committee, 2001-02.

Ad Hoc Committee on Electronic Education, 2001-02.

Subcommittee for Young Investigator Awards, 2002-05.

Annual Meeting Program Committee, 2007-2010.

Awards Committee, 2016-2018.

Trainees Advisory Working Group, 2018-2020.

Annual Meeting Program Committee, 2017-2021:

Program Vice-Chair in 2018-2019, Program Chair in 2019-2020.

ISMRM Web Editorial Board, 2019-2021.



Board of Trustees, 2000-03, 2018-2020.

Board of Trustees, Executive Committee, 2019-2020.

Board of Trustees, Finance Committee, 2019-2021.

IEEE Engineering in Medicine and Biology Society

Program committee and theme co-chair for Engineering in Medicine and Biology Conf., 2004

Biomedical Engineering Society

Imaging and Optics Track co-chair for BMES Annual Meeting, 2004, 2014

External Advisory Boards and External Reviewer:

UC Davis, Imaging Research Center, 2004.

Function BIRN (Biomedical Informatics Research Network), 2005-2009.

Case Western Reserve University, Biomedical Engineering, 2009-2012.

Pittsburgh NMR Center for Biomedical Research (P41), 2004-2013.

University of Florida, Department of Biomedical Engineering, 2011.

Drexel University, School of Biomedical Engineering, 2014.

McGill University, Department of Biomedical Engineering, 2015.

Texas A&M University, Department of Biomedical Engineering, 2015.

Center for Advanced Magnetic Resonance Technology (P41), Stanford University, 2009-2019.

University of Illinois, Department of Bioengineering, 2016-present.

Center for Mesoscale Mapping (P41), Massachusetts General Hospital, 2021-present.

### **Service to Government Agencies:**

#### NSF Review Panels:

NSF Site Visit Team, Biology Research Training Grant, 9/94.

NSF Review Panel, Bioengineering and Aid to Persons with Disabilities, 9/95.

NSF Ad Hoc Reviewer, Collaborative Research in Neuroscience, Computer and Mathematical Sciences and Engineering Program, 5/96

NSF Review Panel, Bioengineering and Aid to Persons with Disabilities, 11/99.

#### NIH Review Panels (> 80; > 20 as Chair or co-Chair):

NIDCD Special Emphasis Review Panel, 11/95.

Multidisciplinary Sciences Special Emphasis Panel, 6/96, 10/96.

Ad Hoc Reviewer, Diagnostic Imaging Study Section, 6/97.

NIMH Special Emphasis Review Panel, 12/98.

Human Brain Project Special Emphasis Panel, 2/99.

NIDA-K Panel, 11/00.

NIMH Conte Center Panel, 3/01.

Brain Disorders and Clinical Neuroscience (BDCN), 3/03, 7/03, 11/03, 3/04, 6/04, 11/04, 3/05, 6/05, 10/05, 2/06, 7/06, 10/07.

NCRR P41 Site Visit Panels, 11/02, 9/06, 10/07.

ZEB1 OSR-B(M2), MRI Imaging Panel, Chair, 3/08.

Clinical Neuroscience and Disease (CND), 10/06, 6/07, 2/08, 6/08.

ZRG1 BDCN-W (99), ARRA Grand Opportunity (GO) Panel, Chair, 7/09.

ZMH1 ERB-C(04), Human Connectome Review, Chair, 3/10.

NIMH Board of Scientific Counselors, Ad Hoc Reviewer, 11/12

NIBIB P41 Review, Chair, 3/13, 5/14.

Clinical Neuroscience and Neurodegeneration (CNN, ad hoc, then charter member), 10/08-06/15.

ZRG1 DTCS-A 81 S, Clinical and Translational Imaging Applications, 10/15.

ZMH1 ERB-S (02), Lifespan Human Connectome Review, Chair, 11/15.

ZRG1 BDCN-W (02), Special Emphasis Panel, Chair, 3/16

ZMH1 ERB-C (04), Lifespan Human Connectome Project: Baby Connectome Review, 3/16.

NIMH Board of Scientific Counselors, Ad Hoc Reviewer, 9/16

ZRG1 RPHB-W 53 R, NIH Director's Early Independence Award (DP5), 11/16.

ZMH1 ERB-C 03 R, BRAIN Initiative: Foundations of Non-Invasive Functional Human Brain Imaging and Recording, 3/17.

ZNS1 SRB-M(01), NINDS Special Emphasis (R24/P30) Panel, 5/17.

ZRG1 BDCN-W (02), Special Emphasis Panel, Chair, 12/17

ZMH1 ERB-C 04 R, BRAIN Initiative Special Emphasis Panel, Chair, 2/18.

ZRG1 ETTN-C (10), Small Business: Clinical Neurophysiology, Devices, Neuroprosthetics, and Biosensors, 11/18.

ZMH1 ERB-C (04), BRAIN Initiative: Data Archives, Integration, and Standards, Chair, 2/19.

ZMH1 ERB-Q 08 S, Integration and Analysis of BRAIN Initiative Data, Chair, 7/19.

NIMH Board of Scientific Counselors, Ad Hoc Reviewer, 9/19.

ZDA1 YXF-U (21) R & ZDA1 YXF-U (09) R, ABCD Study, co-Chair, 11/19.

ZEB1 OSR-D (M1), Brain Initiative RFA (EB-19-001; EB-19-002) SEP, Chair, 2/20.

ZMH1 ERB-C (04), BRAIN Initiative; Data Archives, Integration, and Standards, Chair, 3/20.

ZMH1 ERB-Q (07), BRAIN Initiative: Data Integration and Analysis, Chair, 6/20.

ZRG1 ETTN-E (02), Member Conflict: ETIN panel, Chair, 7/20.

ZRG1 ETTN-E (02). Member Conflict: Emerging Technologies in Neuroscience, Chair, 10/20.

ZMH1 ERB-Q 02 R, BRAIN Initiative: Secondary Analysis and Archiving of BRAIN Initiative Data (R01), Chair, 11/20.

ZMH1 ERB-G (06), NIMH Instrumentation Program (S10), Chair 1/21.

ZNS1 SRB-X (17), BRAIN Circuit Programs BCP U19, 3/21.

ZRG1 BDCN-W (90), Special Emphasis panel, Chair, 4/21.

ZMH1 ERB-G (02), Data Archives for the BRAIN Initiative, Co-chair, 12/21.

ZEB1 OSR-H (M1), BRAIN Initiative Review, 2/22.

ZNS1 SRB-S (12), BRAIN Initiative Review, 11/22  
ZEB1 OSR-H (M1) R, BRAIN Initiative Review, 2/23.  
ZRG1 BN R86 Neuroscience AREA review panel, 6/23.  
ZEB1 OSR-H (M1) R, BRAIN Initiative Review, Co-chair, 2/24.

Other review panels:

MRC/NSERC/SSHRC (Canada), Networks of Centres of Excellence Expert Panel, 6/98.  
Netherlands Organisation for Scientific Research (NWO), ad hoc reviewer, 2/17.

**Service to University:**

University of Michigan, Biomedical Engineering Department (partial listing):

Curriculum Committee, Biomedical Engineering, 1999-2002.  
Executive Committee, 2000-2005, 2006-2013, 2016-2021.  
Undergraduate Education Committee, Chair, 2000-2005.  
ABET Coordinator, 2004-2006.  
Faculty Search Committee, Chair, 2004-2005, 2006-2007, 2024-25.  
Interim Department Chair, 2006-2007.  
Department Chair, 2007-2013.  
Faculty Search Committee, 2015-2020, 2023-24  
Internal Review Committee, 2016.  
Anniversary Planning Committee, 2016-17.  
Associate Chair for Research, 2016-2021.

Other University of Michigan Service Duties (partial listing):

Functional MRI Laboratory, Co-Director, 1998-present.  
Life Science Undergraduate Curriculum Committee, Learning and Memory Subcommittee, 2000.  
Department of Radiology, Research MR Operations Committee, 2001-2003.  
College of Engineering, Strategic Planning Steering Committee, 2002-2003.  
Search Advisory Committee, UM Associate Vice President for Research, 2004.  
Chair, Office of Research (UMOR) Conflict of Interest Committee, 2012-2020.  
Neuroscience Strategic Planning Committee, 2013-14  
Presidential Advisory Committee on the Biosciences, 2014-15  
“Launch Committees” for new faculty mentoring (facilitator and mentor roles), 2014-present.  
Medical School Conflict of Interest Committee, 2015-2020.  
College of Engineering, Dean Search Advisory Committee, 2015-16.  
ADVANCE Advisory Board for the College of Engineering, 2016-2019.

UM Precision Health Initiative Steering Committee, 2016-17.  
Co-Chair, Department of Radiology Department Chair Search Committee, 2017-18.  
UM Task Force on Campus Innovation and Entrepreneurship, 2017-18  
UM Precision Health Initiative Faculty Advisory Committee, 2017-present.  
Institutional Conflict of Interest Committee, 2018-2020.  
College of Engineering, Robotics Future Task Force, 2019-2020.  
Michigan Alzheimer's Disease Research Committee, Executive Committee, 2021-present.

University of Pittsburgh:

Graduate Curriculum Committee, Bioengineering Program, 1994.  
Undergraduate Curriculum Committee, Bioengineering Program, 1995.  
Functional Imaging Research Program, Scientific Advisory Committee, 1995-1998.  
Faculty Search Committee, Department of Electrical Engineering, 1995.  
Department of Radiology, Research Committee, 1996-1998.  
Pittsburgh NMR Center of Biomedical Research, Scientific Advisory Committee, 1998.