

# KRISHNA S. NAYAK

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## EDUCATION

Ph.D. Electrical Engineering	Stanford University	2001
M.S. Electrical Engineering	Stanford University	1996
B.S. Elec Eng, Comp Sci, Appl Math	Florida State University	1995

## PRIMARY POSITIONS

Professor, Electrical Engineering, University of Southern California (joint appointments in Biomedical Engineering and Radiology)	2014-
Associate Professor, Electrical Engineering, University of Southern California	2009-14
Assistant Professor, Electrical Engineering, University of Southern California	2003-09
Lecturer & Research Associate, Electrical Engineering, Stanford University	2001-03

## INDUSTRY POSITIONS

President, Lively Sensors, LLC	2016-
Consultant, Physical Optics Corporation	2016
Consultant, Lithera, Inc.	2013
Consultant, California Heart Centers Group	2009-11
Consultant, Phantoms by Design, Inc.	2002-09
Consultant, NetVMG, Inc.	2001-03

## VISITING POSITIONS

Sabbatical, Lively Sensors, LLC	2017-18
Visiting Professor (1 month), Indian Institute of Sciences	2017
Sabbatical, Laboratory of Cardiac Energetics, NIH/NHLBI Intramural Division	2010-11
Research Professor, Department of Medicine, Loma Linda University	2008-13

## RESEARCH AND TEACHING FIELDS

Magnetic Resonance Imaging	Signals & Systems
Medical Physics	Digital Signal Processing

## HONORS and AWARDS

Elected "Fellow" of SCMR	2018
Elected "Fellow" of AIMBE	2017
USC Community Engagement Award	2014
USC Center for Excellence in Teaching, Faculty Fellow	2013-16
NAE Frontiers of Engineering Education, Participant	2011
GE Healthcare Magnetic Resonance Thought Leader Award	2009
USC Mellon Mentoring Award, Faculty Mentoring of Graduate Students	2008
Elected "Senior Member" of IEEE	2008
USC Viterbi School of Engineering Outstanding Junior Faculty Research Award	2007
Fannie and John Hertz Foundation Doctoral Thesis Prize	2001
ISMRM Student Stipend Recipient	1997-99
Fannie and John Hertz Foundation Graduate Fellowship	1995-00
Tau Beta Pi Centennial Fellowship #11	1995
Phi Kappa Phi Graduate Fellowship	1995

## MEMBERSHIP

American Institute for Medical and Biological Engineering	2017-
American Society for Engineering Education	2011-
American Association for the Advancement of Science	2008-
American Heart Association	2003-
Institute of Electrical and Electronics Engineers (Senior Member 2008-present)	2001-
Society for Cardiovascular Magnetic Resonance (Fellow 2018-present)	2000-
International Society for Magnetic Resonance in Medicine	1996-

## RESEARCH

### FUNDING

- ▶ **Principal Investigator**, NIH/NCI, “Precise DCE-MRI Assessment of Brain Tumors,” R33-CA225400. Sept 2017 – Aug 2020. Total: \$1.6M. KN’s portion: \$1.3M.
- ▶ **Principal Investigator**, NIH/NHLBI, “Novel Myocardial Perfusion Stress Test using Arterial Spin Labeling,” R01-HL130494. July 2016 – June 2020. Total: \$1.7M. KN’s portion: \$1.2M.
- ▶ **Co-Investigator**, NIH/NIDCD, “Dynamics of Vocal Tract Shaping,” R01-DC007142, PI: Shrikanth Narayanan. May 2005 – April 2010. Total: \$2.1M. KN’s portion: \$400k. May 2010 – April 2015. Total: \$2.0M. KN’s portion: \$380k. Dec 2015 – Nov 2020. Total: 2.0M. KN’s portion: \$380k.
- ▶ **Co-Principal Investigator**, NSF, “RI: Medium: Collaborative Research: Understanding individual-level speech variability: from novel articulatory data to robust speaker recognition,” #1514544. PI(s): Shrikanth Narayanan, Krishna Nayak. September 2015 – August 2019. Total: \$1.2M.
- ▶ **Co-Investigator**, NIH/NIDDK, “Optimizing Tissue Iron Quantification at 3 Tesla,” R01-DK097115. PI: John Wood. Sept 2013 – Aug 2018. Total: \$1.6M. KN’s portion: \$140k.
- ▶ **Co-Investigator**, NIH/NIEHS 5P01ES022845-04 and EPA RD-83544101-0, “Southern California Children’s Environmental Health Center (SC-CEHC),” PI: Rob McConnell. June 2013 – May 2018.
- ▶ **Co-Investigator**, NIH/NHLBI, “Model-based Phenotyping of OSAS in Pediatric Obesity using Dynamic MR Imaging,” R01-HL105210. PI: Michael Khoo. Sept 2010 – Aug 2016. (no cost extension) Total: \$3.4M. KN’s portion: \$1.2M.
- ▶ **Co-Investigator**, NIH/NIDDK, “ $\beta$ -cell Preservation through Fat Mitigation,” U01-DK094430. PI(s): Tom Buchanan, Anny Xiang. September 2011 – June 2016. Total: \$3.8M. KN’s portion: \$20k.
- ▶ **Principal Investigator**, American Heart Association, Grant-in-Aid, “Myocardial ASL Perfusion Imaging with Improved Coverage and Sensitivity,” 13GRNT13850012, January 2013 – December 2015. Total: \$140k.
- ▶ **Principal Investigator**, Wallace H. Coulter Foundation, Coulter Translational Research Award, “Myocardial Perfusion Imaging without Contrast Agents,” Phase-I: September 2010 – August 2012. Total: \$180k. Phase-II: September 2012 – August 2015. Total: \$320k.
- ▶ **Co-Investigator**, NIH/NIDDK, “Risk Factors for Type-II Diabetes in Hispanic Adolescents,” R01-DK059211. PI: Michael Goran. Oct 2009 – Sept 2015. Total: \$3.2M. KN’s portion: \$60k.
- ▶ **Co-Investigator**, NIH/NIBIB, “Novel ICA Based Multi-fiber Streamline Tractography Approach,” R21-EB013456. PI: Meng Law. January 2012 – December 2013. Total: \$440k. KN’s portion: \$16k.
- ▶ **Principal Investigator**, NIH/NIDDK, “Rapid MRI Measures of Absolute Fat Mass in Adipose Tissue and Organs,” R21-DK081173. February 2009 – December 2012. (no cost extension). Total: \$450k.
- ▶ **Co-Principal Investigator**, GE Healthcare, “Cardiovascular Magnetic Resonance at 3 Tesla,” PI(s): Gerald Pohost, Krishna Nayak. July 2008 – December 2011. Total: \$320k. KN’s portion: \$240k.
- ▶ **Principal Investigator**, NIH/NHLBI, “Superior Cardiac MRI using Wideband SSFP at 3 Tesla,” R21-HL079987. February 2006 – November 2008. Total: \$430k.

- ▶ **Principal Investigator**, American Heart Association, Scientist Development Grant, “Coronary Magnetic Resonance Angiography at 3 Tesla,” #0435249N, \$260,000. July 2004 – June 2008. Total: \$320k.
- ▶ **Subcontract PI**, NIH/NHLBI, “Comprehensive Assessment of Valvular Function with MRI,” R01-HL074332. PI: John Pauly (Stanford). January 2004 – January 2008. Total: \$350k.

*Total amounts include F&A and indirect costs, and are rounded to two significant digits. If funding is shared by multiple investigators, my portion is listed separately.*

### Small / Pilot Grants

- ▶ **Co-Investigator**, BRACCO Global Investigator, “Evaluation of Regional Gadolinium Retention in the Brain,” PI: Alex Lerner, August 2016 – July 2018.
- ▶ **Co-Investigator**, Wright Foundation, Pilot Grant, “Noninvasive Coronary Endothelial Function using Arterial Spin Labeling,” PI: Parveen Garg, July 2015 – June 2017. \$48,000.
- ▶ **Co-Investigator**, Whittier Foundation, Pilot Grant, “Myocardial ASL Stress Testing in Heart Transplant Recipients,” PI: Andrew Yoon, September 2014 – December 2016. \$100,000.
- ▶ **Co-Investigator**, Southern California Clinical and Translational Science Institute, Pilot Grant, “Drug-Induced Sleep Endoscopy and Magnetic Resonance Imaging in Obstructive Sleep Apnea,” PI: Eric Kezirian, July 2014 – June 2015. \$49,000.
- ▶ **Principal Investigator**, Southern California Clinical and Translational Science Institute, Pilot Grant, “Improved DCE Neuro-MRI using Constrained Reconstruction,” July 2013 – June 2014. \$38,282.
- ▶ **Principal Investigator**, Clinical and Translational Science Institute, Pilot Grant, “MRI Assessment of 3D Blood Flow Dynamics in Patients with Carotid Atherosclerosis,” July 2008 – June 2009. \$41,556.
- ▶ **Subcontract PI**, Respiroics Foundation, “Development of Non-invasive Airway Compliance Assessment using Real-Time MRI,” PI: Ian Colrain (SRI International), January 2008 – July 2008. \$73,150.
- ▶ **Principal Investigator**, Center for Transdisciplinary Research on Energetics and Cancer, Pilot Grant, “Rapid and Non-invasive Quantitation of Abdominal Fat Distribution using Magnetic Resonance Imaging,” September 2007 – August 2008. \$35,000.
- ▶ **Co-Principal Investigator**, James H. Zumberge Research and Innovation Fund, Interdisciplinary Research Grant, “Assessment of Myocardial Perfusion by Cardiac MRI,” with Co-PI: Gerald Pohost, July 2005 – June 2006. \$50,000.
- ▶ **Subcontract PI**, Respiroics Foundation, “Non-invasive Airway Compliance Assessment using Real-Time MRI,” PI: Ian Colrain (SRI International), October 2004 – March 2006. \$86,673.
- ▶ **Principal Investigator**, James H. Zumberge Research and Innovation Fund, Individual Research Grant, “Cardiac Magnetic Resonance Imaging at 3 Tesla,” July 2004 – June 2005. \$25,000.

### Funding from a previous institution (Stanford):

- ▶ **Investigator**, NIH/NHLBI, “Noninvasive Coronary Artery Imaging using MR,” PI: Dwight Nishimura (Stanford), R01-HL39297. July 1992 – August 2007.
- ▶ **Investigator**, NIH/NHLBI, “Integrated Myocardial Ischemia Assessment with MRI,” PI: John Pauly (Stanford), R01-HL67161. January 2003 – December 2007.

- ▶ **Investigator**, NIH/NIBIB, “MR Guided Vascular Interventions,” PI: John Pauly (Stanford), R01-EB002992. September 2003 – July 2007.
- ▶ **Investigator**, NIH/NCI, “High-Speed MRI for Tumor Interventions,” PI: Al Macovski (Stanford), R01-CA50948. July 2000 – June 2003.
- ▶ **Investigator**, California TRDRP, “Comprehensive Evaluation of the Ischemic Leg,” PI: Dwight Nishimura (Stanford), 9RT-0024. July 2000 – June 2003.
- ▶ **Investigator**, NIH/NICRR, “Center for Advanced Magnetic Resonance Technology at Stanford,” PI: Gary Glover (Stanford), R01-HL39297. January 2001 – December 2006.
- ▶ **Investigator**, NIH/NIBIB, “Development of a Prepolarized MRI Extremity Scanner,” PI: Al Macovski (Stanford), R01-EB000346. September 2001 – August 2005.
- ▶ **Investigator**, NIH, “Development of Improved MRI Techniques for Cartilage Injury and Repair,” PI: Al Macovski (Stanford), R01-AR46904. September 1999 – August 2003.

## PUBLICATIONS

### JOURNAL PAPERS (refereed)

1. Y Lim, SG Lingala, SS Narayanan, **KS Nayak**. Dynamic off-resonance correction for spiral real-time MRI of speech. *Magnetic Resonance in Medicine*. accepted
2. X Zhong, T Martin, HH Wu, **KS Nayak**, KH Sung. Prostate DCE-MRI with B1+ Correction using an Approximated Analytical Approach. *Magnetic Resonance in Medicine*. early view online.
3. V Ramanarayanan, S Tilsen, M Proctor, J Töger, L Goldstein, **KS Nayak**, S Narayanan. Analysis of Speech Production Real-Time MRI. *Computer Speech and Language*. 52:1-22. November 2018.
4. HP Do, V Ramanan, X Qi, J Barry, GA Wright, NR Ghugre, **KS Nayak**. Non-contrast Assessment of Microvascular Integrity using Arterial Spin Labeled CMR in a Porcine Model of Acute Myocardial Infarction. *Journal of Cardiovascular Magnetic Resonance*. 20:45. July 2018.
5. TR Jao, **KS Nayak**. Demonstration of Velocity Selective Myocardial Arterial Spin Labeling Perfusion Imaging in Humans. *Magnetic Resonance in Medicine*. 80(1):272-278. July 2018.
6. Y Guo, SG Lingala, Y Bliesener, RM Lebel, Y Zhu, **KS Nayak**. Joint arterial input function and tracker kinetic parameter estimation from under-sampled DCE-MRI using a model consistency constraint. *Magnetic Resonance in Medicine*. 79(5):2804-2815. May 2018.
7. V Landes, **KS Nayak**. Simple Method for RF Pulse Measurement using Gradient Reversal. *Magnetic Resonance in Medicine*. 79(5):2642-2651. May 2018.
8. SG Lingala, Y Zhu, Y Lim, A Toutios, Y Ji, W-C Lo, N Seiberlich, S Narayanan, **KS Nayak**. Feasibility of spiral through-time GRAPPA for low latency accelerated real-time MRI of speech. *Magnetic Resonance in Medicine*. 78(6):2275-2282. December 2017.
9. W Chen, E Gillett, MCK Khoo, SL Davidson Ward, **KS Nayak**. Real-time Multi-slice MRI during Continuous Positive Airway Pressure Reveals Upper Airway Response to Pressure Change. *Journal of Magnetic Resonance Imaging*. 46(5):1400-1408. November 2017.
10. Y Guo, SG Lingala, Y Zhu, RM Lebel, **KS Nayak**. Direct Estimation of Tracer-Kinetic Parameter Maps from Highly Undersampled Brain Dynamic Contrast Enhanced MRI. *Magnetic Resonance in Medicine*. 78(4):1566-1578. October 2017.
11. HP Do, AJ Yoon, MW Fong, F Saremi, ML Barr, **KS Nayak**. Double-gated Myocardial ASL Perfusion Imaging is Robust to Heart Rate Variation. *Magnetic Resonance in Medicine*. 77(5):1975-1980. May 2017.
12. J Töger, T Sorensen, K Somandepalli, A Toutios, SG Lingala, S Narayanan, **KS Nayak**. Test-retest repeatability of human speech biomarkers from static and real-time dynamic magnetic resonance imaging. *Journal of the Acoustical Society of America*. 141(5): 3323. May 2017.
13. SG Lingala, Y Zhu, YC Kim, A Toutios, S Narayanan, **KS Nayak**. A Fast and Flexible MRI System for the Study of Dynamic Vocal Tract Shaping. *Magnetic Resonance in Medicine*. 77:112-125. January 2017.
14. Y Zhu, Y Guo, SG Lingala, RM Lebel, M Law, **KS Nayak**. GOCART: Golden-angle Cartesian Randomized Time-resolved 3D MRI. *Magnetic Resonance Imaging*. 34(7): 940-950. September 2016.
15. Z Wu, W Chen, MCK Khoo, SL Davidson Ward, **KS Nayak**. Evaluation of upper airway collapsibility using real-time MRI. *Journal of Magnetic Resonance Imaging*. 44(1):158-167. July 2016. Recipient of the W.S. Moore Young Investigator Award at ISMRM 2016.

16. Z Wu, F Han, P Hu, **KS Nayak**. Anisotropic Field-of-View Support for Golden Angle Radial Imaging. *Magnetic Resonance in Medicine*. 76(1):229-236. July 2016
17. L Nava-Guerra, WH Tran, P Chalacheva, S Loloyan, B Joshi, TG Keens, **KS Nayak**, SL Davidson Ward, MCK Khoo. Model-based stability assessment of ventilatory control in overweight adolescents with obstructive sleep apnea during NREM sleep. *Journal of Applied Physiology*. 121(1):185-97. July 1 2016.
18. X Miao, SG Lingala, Y Guo, T Jao, M Usman, C Prieto, **KS Nayak**. Accelerated Cardiac Cine MRI Using Locally Low Rank and Finite Difference Constraints. *Magnetic Resonance Imaging*. 34(6):707-714. July 2016.
19. Z Wu, W Chen, **KS Nayak**. Minimum Field Strength Simulator for Proton Density Weighted MRI. *PLoS ONE* 11(5): e0154711. May 2016.
20. Y Guo, RM Lebel, Y Zhu, SG Lingala, MS Shiroishi, M Law, **KS Nayak**. High-resolution whole-brain DCE-MRI using Constrained Reconstruction: Prospective Clinical Evaluation in Brain Tumor Patients. *Medical Physics*. 43(5):2013-2023. May 2016.
21. F Kober, T Jao, T Troalen, **KS Nayak**, Myocardial Arterial Spin Labeling. *Journal of Cardiovascular Magnetic Resonance*. 18:22. April 2016.
22. A Javed, YC Kim, MCK Khoo, SLD Ward, **KS Nayak**. Dynamic 3D MR Visualization and Detection of Upper Airway Obstruction during Sleep using Region Growing Segmentation. *IEEE Transactions on Biomedical Engineering*. 63(2):431-437. February 2016.
23. SG Lingala, BP Sutton, ME Miquel, **KS Nayak**. Recommendations for Real-Time Speech MRI. *Journal of Magnetic Resonance Imaging*. 43(1):28-44. January 2016.
24. VC Rispoli, JF Nielsen, **KS Nayak**, JLA Carvalho. Computational fluid dynamics simulations of blood flow regularized by 3D phase contrast MRI. *Biomedical Engineering Online*. 14:110. November 2015.
25. **KS Nayak**, JF Nielsen, MA Berstein, M Markl, P Gatehouse, R Botnar, D Saloner, C Lorenz, H Wen, BS Hu, F Epstein, J Oshinski, SV Raman. CMR Phase Contrast Imaging. *Journal of Cardiovascular Magnetic Resonance*. 2015 Aug 9;17(1):71
26. **KS Nayak** and RJ Fleck Jr. "Seeing Sleep: Dynamic Imaging of Upper Airway Collapse and Collapsibility in Children." *IEEE Pulse*. 5(5):40-44. September 2014.
27. SS Narayanan, A Toutios, V Ramanarayanan, A Lammert, J Kim, S Lee, **KS Nayak**, YC Kim, Y Zhu, L Goldstein, D Byrd, E Bresch, P Ghosh, A Katsamanis, and M Proctor. "Real-time magnetic resonance imaging and electromagnetic articulography database for speech production research." *Journal of the Acoustical Society of America*. 136(3): 1307-1311. September 2014.
28. YC Kim, RM Lebel, Z Wu, SL Davidson Ward, MCK Khoo, **KS Nayak**. "Real-time 3D MRI of the Pharyngeal Airway in Sleep Apnea." *Magnetic Resonance in Medicine*. 71(4): 1501-1510. April 2014.
29. Z Wu, YC Kim, MCK Khoo, **KS Nayak**. "Evaluation of an Independent Linear Model for Acoustic Noise on a Conventional MRI Scanner and Implications for Acoustic Noise Reduction." *Magnetic Resonance in Medicine*. 71(4):1613-1620. April 2014.
30. RM Lebel, J Jones, JC Ferre, M Law, **KS Nayak**. "Highly accelerated dynamic contrast enhanced imaging." *Magnetic Resonance in Medicine*. 71(2):635-644. February 2014.
31. HP Do, TR Jao, **KS Nayak**. "Myocardial Arterial Spin Labeling Perfusion Imaging with Improved Sensitivity." *Journal of Cardiovascular Magnetic Resonance*. 16:15. January 2014.
32. AZ Lau, AP Chen, Y Gu, M Ladouceur-Wodzak, **KS Nayak**, CH Cunningham. "Noninvasive identification and assessment of functional brown adipose tissue in rodents using hyperpolarized  $^{13}\text{C}$  imaging." *International Journal of Obesity*. 38(1):126-131. January 2014.

33. Y Zu, SS Narayanan, YC Kim, **KS Nayak**, C Bronson-Lowe, B Villegas, M Ouyoung, UK Sinha. "Evaluation of swallow function post tongue cancer treatment using real-time MRI: A pilot study." *Otolaryngology -- Head and Neck Surgery*. 139(12):1312-1319. December 2013.
34. SD Sharma, HH Hu, **KS Nayak**. "Accelerated  $T_2^*$ -Compensated Fat Fraction Quantification Using a Joint Parallel Imaging and Compressed Sensing Framework." *Journal of Magnetic Resonance Imaging*. 38(5):1267-1275. November 2013.
35. SD Sharma, CL Fong, BS Tzung, M Law, **KS Nayak**. "Clinical Image Quality Assessment of Accelerated Magnetic Resonance Neuroimaging using Compressed Sensing." *Investigative Radiology*. 48(9):638-645, September 2013.
36. Y Zhu, MI Proctor, YC Kim, SS Narayanan, **KS Nayak**. "Dynamic 3D Visualization of Vocal Tract Shaping during Speech," *IEEE Transactions on Medical Imaging*. 32(5):838-848. May 2013.
37. CM Toledo-Corral, TL Alderete, HH Hu, **KS Nayak**, S Esplana, T Liu, MI Goran, MJ Weigensberg. "Ectopic Fat Deposition in Pre-diabetic Overweight and Obese Minority Adolescents." *Journal of Clinical Endocrinology & Metabolism*, 98(3):1115-1121, March 2013.
38. T Shin, **KS Nayak**, JM Santos, DG Nishimura, BS Hu, MV McConnell. "Three-dimensional first-pass myocardial perfusion MRI using a stack-of-spirals acquisition." *Magnetic Resonance in Medicine*. 69(3):839-844. March 2013.
39. MI Proctor, E Bresch, D Byrd, **KS Nayak**, SS Narayanan. "Paralinguistic Mechanisms of Production in Human Beatboxing: A Real-Time Magnetic Resonance Imaging Study." *J. Acoust. Soc. Am.* 133(2):1043-1054, February 2013.
40. SD Sharma, HH Hu, **KS Nayak**, "Chemical Shift Encoded Water-Fat Separation Using Parallel Imaging and Compressed Sensing." *Magnetic Resonance in Medicine* 69(2): 456-466, February 2013.
41. AA Joshi, HH Hu, MI Goran, RM Leahy, **KS Nayak**. "Automatic Intra-subject Registration-based Segmentation of Abdominal Fat from 3D Water-Fat MRI." *Journal of Magnetic Resonance Imaging* 37:423-430, February 2013.
42. TB Smith, **KS Nayak**. "Automatic off-resonance correction in spiral imaging with piecewise linear autofocus." *Magnetic Resonance in Medicine*. 69(1):82-90. January 2013.
43. GS Danagoulian, L Qin, **KS Nayak**, RR Colen, S Mukundan Jr., MB Harris, FA Jolesz, A Shankaranarayanan, WA Copen, EJ Schmidt. "Comparison of wideband steady-state free precession and T2-weighted fast spin echo in spine disorder assessment at 1.5 and 3T." *Magnetic Resonance in Medicine* 68(5):1527-1535, November 2012.
44. MK Makhijani, N Balu, K Yamada, C Yuan, **KS Nayak**. "Accelerated 3D MERGE Carotid Imaging using Compressed Sensing with a Hidden Markov Tree Model." *Journal of Magnetic Resonance Imaging* 36(5):1194-1202, November 2012.
45. TB Smith, **KS Nayak**. "Reduced Field of View MRI with Rapid,  $B_1$ -Robust Outer Volume Suppression," *Magnetic Resonance in Medicine* 67(5):1316-1323, May 2012.
46. YC Kim, MI Proctor, SS Narayanan, **KS Nayak**. "Improved imaging of lingual articulation using real-time multislice MRI." *Journal of Magnetic Resonance Imaging* 35(4):943-948. April 2012.
47. SD Sharma, HH Hu, **KS Nayak**. "Accelerated Water-Fat Imaging Using Restricted Subspace Field Map Estimation and Compressed Sensing," *Magnetic Resonance in Medicine* 67(3):650-659, March 2012.
48. Z Zun, P Varadarajan, RG Pai, EC Wong, **KS Nayak**. "Arterial Spin Labeled MRI Detects Clinically Relevant Increases in Myocardial Blood Flow with Vasodilation," *JACC Cardiovascular Imaging* 4(12):1253-1261, December 2011.



49. HH Hu, TR Nagy, MI Goran, **KS Nayak**. Quantification of absolute fat mass by magnetic resonance imaging: a validation study against chemical analysis. *International Journal of Body Composition Research* 9(3):111-122, November 2011.
50. G Hamilton, DL Smith, M Bydder, **KS Nayak**, HH Hu. "Magnetic resonance properties of brown and white adipose tissues," *Journal of Magnetic Resonance Imaging* 34(2):468-473, August 2011.
51. YC Kim, CE Hayes, S Narayanan, **KS Nayak**. "A novel 16-channel receive coil array for accelerated upper airway MRI at 3 Tesla," *Magnetic Resonance in Medicine* 65(6):1711–1717, June 2011.
52. HH Hu, **KS Nayak**, MI Goran. "Assessment of abdominal adipose tissue and organ fat content by magnetic resonance imaging," *Obesity Reviews* 12:e504–e515, May 2011.
53. YC Kim, SS Narayanan, **KS Nayak**. "Flexible retrospective selection of temporal resolution in real-time speech MRI using a golden-ratio spiral view order," *Magnetic Resonance in Medicine* 65:1365–1371, May 2011.
54. T Rhee, JP Lewis, U Neumann, **KS Nayak**. Scan-based volume animation driven by locally adaptive articulated registrations. *IEEE Transactions on Visualization and Graphics*, 17(3):368-379, March 2011.
55. K-A Le, EE Ventura, JQ Fisher, JA Davis, MJ Weigensberg, M Punyanita, HH Hu, **KS Nayak**, MI Goran. "Ethnic differences in pancreatic fat accumulation and its relationship with other fat depots and inflammatory markers," *Diabetes Care* 34:485-490, February 2011.
56. HH Hu, SA Chung, **KS Nayak**, HA Jackson, V Gilsanz. "Differential CT attenuation of metabolically active and inactive adipose tissues: preliminary findings," *Journal of Computer Assisted Tomography* 35(1):65-71, January-February 2011.
57. TB Smith, **KS Nayak**, "An overview of MRI artifacts and correction strategies," *Imaging in Medicine*. 2(4):445-457. August 2010.
58. HL Lee, A Shankaranarayanan, GM Pohost, **KS Nayak**, "Improved 3 Tesla cardiac cine imaging using wideband SSFP," *Magn. Reson. Med.* 63(6):1716-1722, June 2010.
59. JLA Carvalho, JF Nielsen, **KS Nayak**. "Feasibility of in vivo measurement of carotid wall shear rate using spiral Fourier velocity encoded MRI," *Magn. Reson. Med.* 63(6): 1537-1547, June 2010.
60. HH Hu, DL Smith, **KS Nayak**, MI Goran, TR Nagy, "Identification of Brown Adipose Tissue in Mice with Fat-Water IDEAL-MRI," *J. Magn. Reson. Imag.* 31(5):1195:1202. April 2010.
61. HL Lee, A Shankaranarayanan, GM Pohost, **KS Nayak**, "Three-dimensional coronary MR angiography with sub-millimeter resolution using wideband SSFP at 3 Tesla," *J. Magn. Reson. Imag.* 31(5):1224-1229. April 2010.
62. KH Sung, HL Lee, HH Hu, **KS Nayak**, "Prediction of Myocardial Signal during CINE Balanced SSFP Imaging," *Magn. Reson. Mater. Phy. (MAGMA)* 23(2):85-91. April 2010.
63. T Shin, GM Pohost, **KS Nayak**, "Systolic 3D first-pass myocardial perfusion MRI: comparison with diastolic imaging in healthy volunteers," *Magn. Reson. Med.* 63(4): 858-864. April 2010.
64. HH Hu, HW Kim, **KS Nayak**, MI Goran, "Comparison of 3D Fat-Water MRI and Single-Voxel MRS in the Assessment of Hepatic and Pancreatic Fat Fraction," *Obesity* 18(4): 841-847. Apr 2010.
65. TB Smith, Z Zun, EC Wong, **KS Nayak**. "Design and use of Variable Flip Angle Schedules in Transient Balanced SSFP Subtractive Imaging," *Magn. Reson. Med.* 63(2):537-542. February 2010.

66. MK Makhijani, HH Hu, GM Pohost, **KS Nayak**, "Improved Blood Suppression in 3D FSE Vessel Wall Imaging using a combination of Double Inversion Recovery and Diffusion Sensitizing Gradient Preparations," *J. Magn. Reson. Imag.* 31(2):398-405. February 2010.
67. HH Hu and **KS Nayak**. "Change in the proton T1 of Fat and Water in Mixture," *Magn. Reson. Med.* 63(2):494-501. February 2010.
68. Z Zun, EC Wong, **KS Nayak**. "Assessment of myocardial blood flow in humans using arterial spin labeling: feasibility and SNR requirements," *Magn. Reson. Med.* 62(4): 975-83. October 2009.
69. YC Kim, S Narayanan, **KS Nayak**. "Accelerated 3D upper airway MRI using compressed sensing," *Magn. Reson. Med.*, 61(6):1434-40. June 2009.
70. JF Nielsen and **KS Nayak**. "Reference-less phase velocity mapping using balanced SSFP," *Magn. Reson. Med.*, 61(5):1096-1102. May 2009.
71. JF Nielsen and **KS Nayak**. "Interleaved balanced SSFP imaging: artifact reduction using gradient waveform grouping," *J. Magn. Reson. Imag.* 29(3):745-750. March 2009.
72. H Jung, KH Sung, **KS Nayak**, EY Kim, JC Ye. "k-t FOCUSS: a general compressed sensing framework for high-resolution dynamic MRI," *Magn. Reson. Med.*, 61(1):103-116. January 2009.
73. T Shin, HH Hu, GM Pohost, **KS Nayak**. "Three dimensional first-pass myocardial perfusion imaging at 3T: feasibility study," *J. Cardio. Magn. Reson.* 10:57. December 2008.
74. HH Hu and **KS Nayak**. "Quantification of Absolute Fat Mass Using an Adipose Tissue Reference Signal Model," *J. Magn. Reson. Imag.*, 28(6):1483-1491. December 2008.
75. HL Lee and **KS Nayak**. "Stabilization of alternating TR steady state free precession sequences," *J. Magn. Reson.* 195:211-218. December 2008.
76. KH Sung and **KS Nayak**. "Design and use of tailored hard-pulse trains for uniform saturation of myocardium at 3 Tesla," *Magn. Reson. Med.*, 60(4):997-1002. October 2008.
77. CY Liu, P Varadarajan, GM Pohost, **KS Nayak**. "Real-time color flow MRI at 3 Tesla using variable density spiral phase contrast." *Magn. Reson. Imaging*, 26(5):661-666. May 2008.
78. E Bresch, YC Kim, **KS Nayak**, D Byrd, S Narayanan, "Seeing speech: capturing vocal tract shaping using real-time magnetic resonance imaging," *IEEE Signal Proc. Mag.*, 25(3): 123-132. May 2008.
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## BOOK

1. GM Pohost and **KS Nayak**, “Handbook of Cardiovascular Magnetic Resonance Imaging,” Informa Healthcare, New York, 2006. ISBN: 0824758412.

## BOOK CHAPTERS

1. R Vliegenthart, M Jerosch-Herold, **KS Nayak**, T Leiner, S Plein. “Myocardial Perfusion and Permeability,” in MR and CT Perfusion Imaging: Clinical Applications and Theoretical Principles, Ed: Roland Bammer, Wolters-Kluwer, 2015. ISBN: 9781451147155.
2. VC Rispoli, JLA Carvalho, JF Nielsen, **KS Nayak**. “Assessment of Carotid Flow Using Magnetic Resonance Imaging and Computational Fluid Dynamics,” in Fluid Dynamics, Computational Modeling and Applications, Ed: L. Hector Juarez, InTech, 2012. ISBN: 978-953-51-0052-2.
3. JLA Carvalho and **KS Nayak**. “Rapid Quantitation of Aortic Valve Flow Using Spiral Fourier Velocity Encoded MRI,” in Aortic Valve, Eds: Ying-Fu Chen and Chwan-Yao Luo, InTech, 2011. ISBN: 978-953-307-561-7.
4. HH Hu, MI Goran, **KS Nayak**, “Assessment of Abdominal Adiposity and Organ Fat with Magnetic Resonance Imaging,” in Role of the Adipocyte in Development of Type 2 Diabetes, Ed: Coleen Croniger, InTech, 2011. ISBN: 978-953-307-598-3.
5. **KS Nayak**, JF Nielsen, “CMR Imaging Methods,” in Atlas of Cardiovascular Magnetic Resonance, Eds: W Manning and E Braunwald, Springer—Current Medicine, 2009. ISBN: 1573402990.
6. **KS Nayak**, GM Pohost, “Ischemic Heart Disease: Myocardial Perfusion Imaging,” in Handbook of Cardiovascular Magnetic Resonance Imaging, Eds: GM Pohost and KS Nayak, Informa Healthcare, 2006, p179–194.
7. GM Pohost, **KS Nayak**, “The Future of CMR,” in Handbook of Cardiovascular Magnetic Resonance Imaging, Eds: GM Pohost and KS Nayak, Informa Healthcare, 2006, p425–434.
8. P Varadarajan, K Souibri, **KS Nayak**, GM Pohost, “Cardiovascular magnetic resonance: Evaluation of myocardial function, perfusion and viability,” in Cardiac CT, PET and MR, Eds: V Dilsizian and GM Pohost, Blackwell Futura, 2006, p155–191.

## PATENTS

1. **KS Nayak**, "Magnetic Measurement of Fat Fraction," US Provisional Application 62/440,294, December 2016.
2. HP Do, TR Jao, **KS Nayak**, "Multi-Pulsed Arterial Spin Labeled Magnetic Resonance Imaging," USC Disclosure #D2014-0072. April 2014.
3. Y Zhu, Y Guo, RM Lebel, **KS Nayak**, "Method for Dynamic 3D MRI Data Sampling," USC File #2014-227. US Provisional Application 61/980,462. April 2014.
4. **KS Nayak** and Y Chai, "Alignment Indicator for Dental Radiography," USC File #2014-187. February 2014.
5. T Smith and **KS Nayak**, "Method for Reduced Field-of-View MRI in an inhomogeneous field with rapid Outer Volume Suppression," U.S. Patent #9,739,861. Issued August 2017.
6. T Jao, Z Zun, and **KS Nayak**, "Efficient Mapping of Tissue Properties for Unregistered Data with Low Signal-to-Noise Ratio," (under review) U.S. Patent Application #13/231,741. March 2012.
7. K Sung and **KS Nayak**, "Tailored radiofrequency pulses for uniform saturation in magnetic resonance imaging," U.S. Patent #8,324,898. issued Dec. 2012.
8. JF Nielsen and **KS Nayak**, "Eddy-current artifact reduction in balanced steady-state free precession magnetic resonance imaging," U.S. Patent #8,283,924. issued Oct. 2012.
9. HL Lee and **KS Nayak**, "Preparing the magnetization state of a sample for alternating repetition time steady state free precession magnetic resonance imaging," U.S. Patent #8,269,494, issued September 2012.
10. JF Nielsen and **KS Nayak**, "Fast velocity measurements using balanced SSFP magnetic resonance imaging," U.S. Patent #8,212,561. issued July 2012.
11. CH Cunningham, **KS Nayak**, JM Pauly, "RF field mapping for magnetic resonance imaging," U.S. Patent #7,446,526. issued Nov. 2008. Licensed to GE, Siemens, and Philips.
12. K Sung and **KS Nayak**, "Compensating for non-uniformity of excitation field in MRI," U.S. Patent #7,372,270. issued May 2008.
13. **KS Nayak** and BA Hargreaves, "Steady-State Free-Precession MRI with Increased Signal Bandwidth," U.S. Patent #7,332,908. issued Feb. 2008. Licensed to GE, Siemens, and Philips.
14. **KS Nayak** "Ultra-short T2 Imaging Pulse Sequence," 2003, software licensed to GE.
15. KI Iourcha, **KS Nayak**, Z Hong, "System and Method for Fixed-rate Block-based Image Compression with Inferred Pixel Values," U.S. Patent #5,956,431, issued Sept. 1999. Continuation: "Fixed-rate Block-based Image Compression with Inferred Pixel Values," U.S. Patent #6,658,146, issued Dec. 2003. Continuation: "Fixed-rate Block-based Image Compression with Inferred Pixel Values," U.S. Patent #6,683,978, issued Jan. 2004. Continuation: "Fixed-rate Block-based Image Compression with Inferred Pixel Values," U.S. Patent #6,775,417, issued Aug. 2004. Continuation: "Fixed-rate Block-based Image Compression," U.S. Patent #7,039,244, issued May 2006. Continuation: "Image Processing System," U.S. Patent #7,043,087, issued May 2006. Continuation: "Imaging CODEC Engine," U.S. Patent #7,801,363, issued Sept. 2010.

## INVITED TALKS

### INVITED CONFERENCE TALKS

1. Journal to Awareness of Social Bias in Science, RESONATE: Discussion of Scientific and Social Biases within ISMRM. ISMRM/ESMRMB Scientific Sessions, Paris, June 2018.
2. Acquisition Strategies: CE and NCE Approaches, Sunrise Course: Advanced Techniques in Cardiovascular MR: Tissue Perfusion, ISMRM/ESMRMB Scientific Sessions, Paris, June 2018.
3. Advanced Reconstruction Techniques for DCE/DSC, Weekend Course: Advanced Topics in Perfusion MRI, ISMRM/ESMRMB Scientific Sessions, Paris, June 2018.
4. Arterial Spin Labeling, Session: Non-contrast Methods, SCMR/ISMRM Co-Provided Workshop on CMR in Ischemic Heart Disease, Barcelona, February 2018.
5. Diagnostic Real-Time MRI, Plenary Session "Dynamic Real-Time MRI", ISMRM 2017 Scientific Sessions, Honolulu, HI, April 2017.
6. MR Phase Imaging, ISMRM Workshop on Quantitative MR Flow: Innovation & Implementation for Clinical & Physiological Insights, San Francisco, CA, October 2016.
7. MRI at Multiple Spatial Scales, daVinci Convergence Symposium - Imaging Across Scales, Santa Monica, CA, February 2016.
8. Myocardial ASL Perfusion, ISMRM Workshop on Non-Contrast Cardiovascular MRI, Long Beach, CA, March 2015.
9. Real-Time Imaging and Compressed Sensing, Gordon Research Conference on In-Vivo NMR, Proctor Academy, Andover, NH, July 2014.
10. Imaging Challenges at 3T and Above, ISMRM 2014, Course: Cardiovascular MRI at 3T and Beyond, Milano, Italy, May 2014.
11. Real-Time MRI of Speech Production, Speech MRI Summit, Los Angeles, CA, February 2014.
12. How to Quantify Blood Flow, SCMR 16th Scientific Sessions, Physician Pre-conference Course, January 2014.
13. What is Compressed Sensing and How Can We Use It? ASFNR-ISMRM Session on Ultrafast MR Imaging, ASNR 51st Annual Meeting, San Diego, CA, May 2013.
14. New CMR Sequences and Techniques. ISMRM 2013 Weekend Course, Recent Innovations in Cardiovascular MR, Recent Developments in Hardware and Software Relevant to CMR. Salt Lake City, April 2013.
15. Towards myocardial perfusion imaging using arterial spin labeling at high fields. SCMR-ISMRM Joint Workshop: New Horizons in High-Field Cardiovascular MR: Promise and Progress. San Francisco, CA, January 2013.
16. New CMR Sequences and Techniques. ISMRM 2012 Weekend Course, Recent Advances in Cardiovascular MR, Recent Developments in Hardware and Software. Melbourne, Australia, May 2012.
17. Non-contrast perfusion methods: Ready for prime time? SCMR 14th Scientific Sessions, Orlando, FL, February 2012.
18. CMR Perfusion using Arterial Spin Labeling. GE Lunchtime Symposium at the SCMR 14th Scientific Sessions, Nice, France, February 2011.
19. Novel Myocardial Perfusion Techniques: Arterial Spin Labeling. SCMR 14th Scientific Sessions, Basic Science Pre-conference Course. Nice, France, February 2011.
20. Advanced Pulse Sequences for 3 Tesla CMR. ISMRM 18th Scientific Sessions, Sunrise Course: Cardiovascular MR Imaging, Stockholm, May 2010.
21. Tools for Mapping and Quantitative Imaging. ISMRM 18th Scientific Sessions, Educational Course: Imaging Strategies, Stockholm, May 2010.

22. Update on Myocardial Perfusion using Arterial Spin Labeling. SCMR 13th Scientific Sessions, Phoenix, AZ, January 2010.
23. Technical Challenges and Solutions for CMR at 3 Tesla. SCMR High-Field and Basic Science Pre-conference workshop. Phoenix, AZ, January 2010.
24. Real-Time Measurement of Cardiac Function and Flow. ISMRM Workshop on Cardiovascular Function, Flow, and Tissue Mechanics. Sintra, Portugal, September 2009.
25. Quantitative MRI of Abdominal Fat: Recent Developments. NCI Transdisciplinary Research on Energetics and Cancer (TREC) Scientific Meeting. Cleveland, OH, May 2009.
26. Myocardial Perfusion using Arterial Spin Labeling. SCMR 12th Scientific Sessions, Orlando, FL, January 2009.
27. Real-Time Imaging at 3T. SCMR 11th Scientific Sessions, Los Angeles, CA, February 2008.
28. Handling RF Variation at 3T. Workshop on High-Field Cardiovascular MR: An Update, Los Angeles, CA, January 2008.
29. Real-Time Imaging at 3T. ISMRM 15th Scientific Sessions, Clinical Categorical Course: Cardiovascular Imaging at High Field, Berlin, May 2007.
30. Strategies for collecting temporally-resolved physiological data. ISMRM 15th Scientific Sessions, Educational Course: MR Physics for Physicists, Berlin, May 2007.
31. Spiral and Real-Time Imaging. SCMR 10th Scientific Sessions, Rome, February 2007.
32. The Current Cutting-Edge in Rapid CMR Imaging, SCMR 10th Scientific Sessions, Rome, February 2007.
33. Spiral and Real-Time Imaging. NIH/NIBIB Workshop on High-Field Cardiovascular Magnetic Resonance, Washington, DC, September 2006.
34. EPI Artifact Correction using Parallel Imaging. IEEE-EMBS, Special Session on Cardiac Imaging, September 2006.
35. Real-Time Flow Imaging. ISMRM Workshop on Flow and Motion: Imaging Assessment of Cardiovascular and Tissue Mechanics, New York, July 2006.
36. Recent Advances in the Diagnosis of Coronary Artery Disease. North American Konkani Association Medical Symposium, Hamilton, Ontario, July 2006.
37. Real-Time Color Flow MRI. ISMRM 14th Scientific Sessions, Flow and Motion Study Group Meeting, Seattle, May 2006.
38. Spirals at High Field. SCMR 9th Scientific Sessions, Basic Science Plenary Session: Parallel and Other Novel Imaging Techniques, Miami, January 2006.
39. Identification, Modeling and Correction of Image Artifacts. ISMRM 13th Scientific Sessions, Educational Course: MR Physics for Physicists, Miami, May 2005.
40. Real-Time Cardiac Imaging. GE-Asia Seminar Series (five locations): Sydney, New Delhi, Mumbai, Beijing, and Shanghai, March 2005.
41. How to Transition to the Real World. SCMR 8th Scientific Sessions, Trainee and Students Hour, San Francisco, January 2005.
42. Non-cooperative Patients and Arrhythmia: Real-Time and Single Shot Imaging. SCMR 8th Scientific Sessions, Pre-Conference Workshop, San Francisco, January 2005.
43. Cardiovascular 3T Imaging. NASCI 32nd Annual Meeting, Next Generation Cardiac MR Session, Amelia Island, October 2004.
44. Hemodynamic Visualization with Real-Time MRI. University of Toronto Real-Time MRI Workshop, Toronto, July 2003.

## COLLOQUIA

University of California at Berkeley, Bioengineering Seminar, May 2018  
 University of Southern California, Cardiology Grand Rounds, March 2018  
 Axilor Ventures, December 2017  
 GE John F. Welch Technology Center, December 2017  
 Dayananda Sagar College of Engineering, November 2017  
 ISMRM India Chapter, November 2017  
 Indian Institute of Sciences, Computational and Data Sciences, November 2017  
 University of Wisconsin-Madison, Medical Physics, October 2017  
 Arizona State University, Biomedical Engineering, September 2017  
 University of California, San Diego, Physiology & Medicine, June 2017  
 Case Western Reserve University, Case Center for Imaging Research, October 2016  
 University of California, Davis, Radiology Grand Rounds, October 2016  
 Cincinnati Children's Hospital, Radiology Grand Rounds, October 2014  
 University of California, Los Angeles, Department of Radiology, June 2014  
 University of Calgary, Alberta, Canada, June 2013  
 University of California, San Diego, Center for Functional MRI, May 2013  
 University of Southern California, Center for Excellence in Teaching, May 2013  
 Cedars-Sinai Medical Center, Biomedical Imaging Research Institute, January 2013  
 Seoul National University Hospital, Seoul, South Korea, August 2012  
 Neuroscience Research Institute, Gachon University, Incheon, South Korea, August 2012  
 NIH / NHLBI Laboratory for Cardiac Energetics, Bethesda, June 2010.  
 Linköping University Hospital, Linköping, Sweden, February 2010.  
 University of Louisville, Electrical Engineering, Louisville, November 2009  
 University of California, San Diego, Penner Biomechanics Seminar, October 2009  
 Brigham and Women's Hospital, Department of Radiology, October 2009  
 FAMU/FSU College of Engineering, May 2009  
 Loma Linda University Medical Center, May 2008  
 Yale University, Bioimaging Science Lecture Series, November 2006.  
 University of California, San Diego, Center for Functional MRI, August 2006.  
 GE Global Research Center, Niskayuna, July 2006.  
 University of Virginia, Biomedical Engineering, Charlottesville, April 2006.  
 Johns Hopkins University, Radiology, Baltimore, April 2006.  
 Florida State University, Computer Science, Tallahassee, November 2004.  
 NIH / NHLBI Laboratory for Cardiac Energetics, Bethesda, February 2004.  
 Medtronic AVE Inc., Santa Rosa, June 2003.  
 Linköping University Hospital, Linköping, Sweden, October 2002.  
 Guidant Inc., Santa Clara, September 2001.  
 Agilent Labs, Palo Alto, April 2001.  
 Kawasaki Medical College, Okayama, Japan, July 2000.

## TEACHING & MENTORING

### TEACHING and MENTORING GRANTS

- **Principal Investigator**, National Science Foundation, “New GK-12: Body Engineering Los Angeles,” Grant #1045595. August 2011-July 2016. \$1,400,000. (with ~\$1M matching funds from the USC Viterbi School of Engineering)
- **Principal Investigator**, SAMPE Foundation, “GK-12: Body Engineering Los Angeles,” August 2014. \$10,000.
- **Principal Investigator**, Stevens Institute for Innovation, Innovation Inside Curriculum Grant, “Commercialization of Magnetic Resonance Imaging Technology,” December 2007. \$2,000.

### DIRECT TRAINEES

Name	Degrees, Years	Current Position
Joao Luiz Carvalho	PhD, 2004-08	Associate Professor, Universidade de Brasilia (Brazil)
Kyunghyun Sung	PhD, 2004-08	Assistant Professor, University of California, Los Angeles
Hsu-Lei Lee	PhD, 2004-08	Research Fellow, Queensland Brain Institute (Australia)
Taehoon Shin	PhD, 2004-09 Postdoc, 2009-10	Assistant Professor, University of Maryland & Ewha Womans University
Chia-Ying Liu	Postdoc, 2004-06	Assistant Professor, Johns Hopkins University
Jon-Fredrik Nielsen	Postdoc, 2005-08	Research Assistant Professor, University of Michigan, Ann Arbor
Yoonchul Kim	PhD, 2005-10 Postdoc, 2010-14	Scientist, Samsung Medical Center (Korea)
Zungho Zun	PhD, 2005-10	Assistant Professor, Children’s National Medical Center
Mahender Makhijani	PhD, 2005-12	Senior Engineer, Continuum Analytics
Houchun Hu	Postdoc, 2006-09	Director of Radiology Research, Nationwide Children’s Hospital
Samir Sharma	PhD, 2007-12	Engineer, Toshiba America Medical Systems,
Travis Smith	PhD, 2007-12	Research Assistant Professor, Oregon Health Sciences University
Marc Lebel	Postdoc, 2010-12	Scientist, GE Applied Sciences Laboratory (Canada)
Yinghua Zhu	PhD, 2010-15	Engineer, Google
Ziyue Wu	PhD, 2011-15	Scientist, All-Tech Medical Systems USA
Johannes Töger	Postdoc, 2015-16	Researcher, Lund University (Sweden)

Name	Degrees, Years	Current Position
Sajan Lingala	Postdoc, 2014-17	Assistant Professor, University of Iowa
Hung Phi Do	PhD, 2010-2017 Postdoc, 2017	MR Clinical Collaborations Manager Toshiba America Medical Systems
Yi Guo	PhD, 2012-2017	Engineer, SnapChat
Terrence Jao	PhD, 2011-2017	Medical Student, USC
Vanessa Landes	PhD, 2012-	
Ahsan Javed	PhD, 2012-	
Weiyi Chen	PhD, 2013-	
Xin Miao	PhD, 2013-	
Yannick Bliesener	PhD, 2015-	
Yongwan Lim	PhD, 2015-	
Namgyun Lee	PhD, 2018-	
Sagar Sudhakara	PhD, 2018-	
Zhibo Zhu	PhD, 2018-	

### INDIRECT TRAINEES (not the primary advisor)

Name	Degrees, Years	Current Position
Erik Bresch	PhD, 2005-2010	Scientist, Philips Research Laboratories (Netherlands)
Taehyun Rhee	PhD, 2005-2010	Senior Lecturer, Victoria University of Wellington (New Zealand)
Eamon Doyle	PhD, 2011-2017	Medical Student, Vanderbilt University
Adam Bush	PhD, 2011-2017	Postdoc, Stanford-Lucile Packard Children's Hospital

### TRAINEE AWARDS

Ziyue Wu, W.S. Moore Young Investigator Award, ISMRM	2016
Sajan Lingala, USC Provost's Postdoctoral Scholar Research Grant	2015
Ziyue Wu, Grodins Graduate Award (#1 PhD student in the BME department)	2015
Ziyue Wu, Coulter Award, BME Department	2015
Yoon-chul Kim, American Heart Association Postdoctoral Fellowship	2013-15
Christopher Sandino, USC McNair Scholar	2013
Travis Smith, Ming Hsieh Institute Best PhD Dissertation Award	2013
Samir Sharma, Best Research "Fast Pitch", USC EE Research Festival	2012
Travis Smith, American Heart Association Predoctoral Fellowship	2011-12
Samir Sharma, Ming Hsieh Institute Ph.D. Scholar (one of five)	2011-12
Taehoon Shin, American Heart Association Postdoctoral Fellowship	2009-11
Hsu-Lei Lee, USC Women in Science and Engineering, Merit Award	2008
Taehoon Shin, Best Student Paper Honorable Mention, USC EE Department	2008
Joao Carvalho, Best Student Paper Award, USC EE Dept.	2007
Joao Carvalho, USC Dissertation Completion Fellowship	2007-08

Jon-Fredrik Nielsen, American Heart Association Postdoctoral Fellowship	2006-08
Numerous conference travel grants (not practical to list individually)	2005-
Numerous conference paper awards (listed above under Publications)	2005-

## DISSERTATION COMMITTEES

- **Ph.D. Thesis Defense and Qualifying Exam:** Dimitrios Pantazis (EE), Manjiang Zhang (Physics), Hsiao-Fen Chou (Civil), Ismail Sebe (EE), Fariba Ariei (EE), Bei Wang (EE), Yuri Brun (CS), Nilesh Ghugre (BME), Taehyun Rhee (CS), Anand Joshi (EE), Ramakrishnan Iyer (BME), Matthew Behrend (EE), Alec Wong (BME), Kenneth Hayworth (Neuroscience), Jonghye Woo (EE), Sangeetha Somayajula (EE), Hua Hui (EE), Erik Bresch (EE), Jay Mung (BME), Vikram Ramanarayanan (EE), Samantha Cunningham (BME), Wentao Zhu (EE), Seth Nfonoyim-Hara (BME), Chitresh Bhushan (EE), Brian Hsu (Linguistics), Yi Lao (BME), Eamon Doyle (BME), Adam Bush (BME).
- **Ph.D. Qualifying Exam Only:** Changsung Kim (EE), Jingliang Peng (EE), Dahua Xie (EE), Esen Kucukaltun-Yildirim (EE), Belma Dogdas (EE), Abhijit Chaudhari (EE), Yousef Al-Rjoub (Civil), Pankaj Mishra (EE), Chiao Wang (EE), Jong Dae Oh (EE), Sanghee Cho (EE), Sundeep Pattem (EE), Joyita Dutta (EE), Juan Soto (EE), Dongwoo Kang (EE), Matthew Borzage (BME), Wentao Zhu (EE), Yanguang Lin (EE), Adam Bush (BME), Joseph Crew (BME), Eamon Doyle (BME), Yi Lao (BME), Yang Li (BME), Chi Tat Chiu (BME), Yu Ryan Chen (BME), Zhaojun Yang (EE), Niharika Gajawelli (BME), Azarang Golmohammadi (EE), Divya Varadarajan (EE), Daeun Kim (EE), Minqi Chong (EE).
- **M.S. Thesis Committees:** Abhijit Kher (BME), Amrita Rajagopalan (BME), Naren Nallapareddy (EE), Grant Haskins (BME).

## DIRECTED RESEARCH

- **Medical Students:** Terrence Jao (USC MD/PhD), Gabriel Rudd-Barnard (Drexel MD)
- **Ph.D. Students:** Barry Vanek (EE), Zihong Fan (EE), Firooz Aflatouni (EE), Stephen Tobin (Linguistics), Ximing Wang (BME), Eric Sohn (BME), Adam Bush (BME), Yunhua Ji (BME).
- **M.S. Students:** Kyunghyun Sung (EE), Antonio Ordonez (EE), Aditya Sane (EE), Taek-yoon Nam (EE), Vishwanath Kottignahal (EE), Ashish Medewar (EE), Peter Shin (EE), Vikram Ramanarayanan (EE), Niharika Gajawelli (EE), Jack Chang (EE), Ziyue Wu (BME), Yinghua Zhu (EE), Divya Varadarajan (EE), Cecilie Anker (Informatics, TU-Denmark), Josephine Jensen (Informatics, TU-Denmark), Naren Nallapareddy (EE), Siyuan Meng (EE), Shayan Farzad (EE), Jieshen Chen (EE).
- **Undergraduates:** Eamon Doyle (Olin College), Sameer Chopra (UC-Riverside), David Chartash (U Western Ontario), Tim Brochier (USC), Melanie Houselog (USC), Samantha Kaplan (USC), Sheldon Cheng (USC), Christopher Sandino (USC), Sam Thornton (USC), Andriana Ayiotis (USC), Natasha Goran (University of Leeds, UK), Octavio Marin Pardo (UNAM, Mexico), Jieshen Chen (USC).
- **High School Students:** Arjun Viswanathan (Minnetonka High School, Minnesota), Nikhil Rajulapati (Trinity Preparatory School, Florida).

## CLASSROOM TEACHING @ USC (student evals: 1.00 is poor, 5.00 is excellent)

Magnetic Resonance Imaging and Reconstruction (EE 591)



Spring 2004 (4.65), Fall 2004 (4.71), Fall 2005 (5.00), Fall 2007 (4.78),  
 Fall 2009 (4.79), Spring 2012 (4.79), Spring 2015.  
 Advanced Topics in Magnetic Resonance Imaging (EE 691)  
 Fall 2008 (4.44), Fall 2012 (4.70).  
 Electrical Engineering Research Seminar (EE 598)  
 Fall 2012 (4.75), Fall 2013 (4.75)  
 Engineering Freshman Academy (ENGR 102)  
 Fall 2011 (4.86 & 4.42), Fall 2012 (4.57 & 4.62), Fall 2013 (4.44 & 4.69),  
 Fall 2014 (4.42 & 4.25).  
 Digital Signal Processing (EE 483)  
 Spring 2005 (4.32).  
 Introduction to Linear Systems (EE 301)  
 Spring 2007 (4.12), Spring 2009 (4.45), Spring 2014 (3.58), Spring 2016.  
 Real-Time DSP Laboratory (EE 434L)  
 Spring 2008 (3.86).  
 Advanced Real-Time DSP Laboratory (EE 586L)  
 Spring 2008 (4.44).  
 Introduction to Electrical Engineering Systems (EE 200L)  
 Spring 2010 (4.17).  
 EPIC Programming (programming language for GE MRI scanners, informal course)  
 Oct-Dec 2004, June-Aug 2005, Feb-April 2006, May-June 2008, July-Aug 2010.

### **CLASSROOM TEACHING @ Stanford** (student evals: *5.00 is poor, 1.00 is excellent*)

Introductory Digital Signal Processing (EE 103)  
 Summer 2001 (1.43), Summer 2002 (1.25).  
 Statistical Signal Processing (EE 278)  
 Summer 2003.

### **OTHER MENTORING**

- Stanford Alumni Mentoring 2009-
- Society for Cardiovascular Magnetic Resonance Mentoring Program 2011-

### **OTHER OUTREACH**

- Prepared a teaching unit on Medical Imaging appropriate for a high-school physics course, for the USC Physics Instant Update, a workshop for LA-area high-school physics teachers run by Prof. Stephan Haas (Physics).

## SERVICE

### WORKSHOP ORGANIZATION

Program Committee, SCMR Scientific Sessions. Barcelona, Spain	2018
Co-Chair, SCMR/ISMRM Co-Provided Workshop Probing Mechanisms of Heart Disease: Micro to Macro to Model. Washington DC	2017
Program Committee, SCMR Scientific Sessions. Washington DC	2017
Member of Organizing Committee, ISMRM Workshop on Flow and Motion Quantification. San Francisco, CA	2016
Program Committee, SCMR Scientific Sessions. Nice, France	2015
Member of Organizing Committee, ISMRM Workshop on Non-Contrast Cardiovascular MRI. Long Beach, CA	2015
Chair, USC Speech MRI Summit. Los Angeles, CA	2014
Member of Organizing Committee, SCMR/ISMRM Joint Workshop on High-Field Cardiovascular Magnetic Resonance. San Francisco, CA	2013
Program Committee, SCMR Scientific Sessions. Orlando, FL	2012
Co-Organizer, SCMR Pre-conference Session on High-Field Cardiovascular Imaging and Basic Science. Phoenix, AZ	2010
Member of Organizing Committee, ISMRM Workshop on Data Sampling and Image Reconstruction. Sedona, AZ	2009
Co-Chair, Workshop on High-Field Cardiovascular MR: An Update. Beverly Hills, CA	2008
Member of Organizing Committee, ISMRM Workshop on Non-Cartesian MRI. Sedona, AZ	2007
Member of Organizing Committee, NIH/NIBIB Workshop on High-Field Cardiovascular MR: the promise, the problems, the potential solutions. Washington DC	2006
Chair, ISMRM Workshop on Real-Time MRI: Dynamic Interactive Imaging and its Applications. Santa Monica, CA	2006

### GRANT REVIEW

- National Institutes of Health:
  - ZRG1 DTCS-A (81) S, Mail Reviewer, Feb 2015.
  - ZHL1 CCT-Q C1 Wireless Physiologic Telemetry for Interventional MRI, Sept 2013.
  - ZHL1 CCT-H C4 NHLBI SBIR Phase I/II Contract Review, Feb 2013.
  - ZHL1 CCT-N C2 B Wireless Physiologic Telemetry for Interventional MRI, Feb 2012.
  - ZRG SBIBU55 Academic-Industry Partnerships Panel, Jun 2010.
  - ZHL1 K99/R00 Panel, Feb 2010.
  - SBIB L30 Special Emphasis Panel, High End Shared Instruments Panel, Nov 2009.
- American Heart Association:
  - Western States Bioengineering Panel, Spring 2010.
  - Radiology, Imaging, and Surgery Panel, Fall 2007, Spring 2008, Fall 2008.
- USC Internal Grants:
  - SC-CTSI, Pilot and Translational Research Grants, 2013.

- o “Cardiovascular, Metabolism, and Neuroscience”, “Systems Biology and Bioengineering”
  - o SC-CTSI, Pilot and Translational Research Grants, 2012.
    - o “Biology, Bioengineering, Molecular Medicine”, “Diabetes, Obesity, Metabolic Diseases”
  - o Clinical Translational Science Initiative, Pilot and Feasibility Grants, 2008.
  - o James H. Zumberge Research and Innovation Fund, 2007.
  - o Saban Research Institute, Career Development Fellowships, 2006.
- Other:
  - o Technology Foundation STW (Netherlands), Innovation Research Incentive Grants, May 2010.
  - o Instituto de Telecomunicações (Portugal), Information Technology Grants, April 2014.

## JOURNAL REVIEW

- Reviewer:
 

Magnetic Resonance in Medicine	2000-
Journal of Magnetic Resonance Imaging	2001-
Journal of Cardiovascular Magnetic Resonance	2002-
IEEE Transactions on Medical Imaging	2007-
MAGMA – Magnetic Resonance Materials in Physics, Biology, and Medicine	2008-
Journal of the American College of Cardiology – Cardiovascular Imaging	2008-
Circulation – Cardiovascular Imaging	2009-
Concepts in Magnetic Resonance Part A	2009-
Radiology	2010-
Investigative Radiology	2010-
PLOS ONE	2013-
- Editorial Board Member:
 

Journal of Cardiovascular Magnetic Resonance	2002-10
Current Cardiology Reviews	2004-11
- Conference Paper/Abstract Reviewer:
 

ISMRM Scientific Sessions	2005-
SCMR Scientific Sessions	2012
ISMRM Workshops (several years)	2006-
ISBI	2005-09

## OTHER PROFESSIONAL SERVICE

- International Society for Magnetic Resonance in Medicine
 

Young Investigator Awards Committee, Member	2012-14
Nominating Committee, Member	2016
- Society for Cardiovascular Magnetic Resonance,
 

Science Committee, Member	2006-12
Science Committee, Chair	2010-12
Election Committee, Member	2011
Annual Meeting Program Committee, Member	11,16,17

- External Review Board, National Institutes of Health, “Training in Cardiac Magnetic Resonance Imaging,” T32 Training Grant (T32HL007846) to Stanford University.

## UNIVERSITY SERVICE

### University of Southern California

Center for Excellence in Teaching, Faculty Fellow	2013-16
Center for Excellence in Teaching, Academic Careers Week, Session Staff	2009-13
3TMRI for Cardiovascular and Neuroimaging, Technical Advisory Board	2006-
University Hospital MRI Unit, Technical Advisory Board	2004-
Dornsife Neuroimaging Center, Technical Advisory Board	2004-12

### Viterbi School of Engineering

Appointment, Promotion, and Tenure (APT) Committee Member	2011-13
Viterbi Research Awards Committee	2012
Electrical Engineering Department Unification, Committee Member	2009
Interviewer, Presidential and Trustee Scholars	2006-07

### Ming Hsieh Department of Electrical Engineering

Faculty Recruitment Committee	2014-
Ming Hsieh Institute	
Advisory Council	2013-16
Educational Talks on NSF & NIH Funding	2013
MHI Scholars Selection Committee	2011
Signal and Image Processing Group	
Screening Exam Coordinator	2003-12
Admissions and Fellowship Nomination Committee	2008-12
Annual Faculty Merit Review, Committee Member	2010, 2012, 2017
Faculty Candidate Evaluation (several short appointments)	2006-