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Department of Medicine (Cardiovascular Division)
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EDUCATION

Beth Israel Deaconess Medical Center, Harvard Medical School Boston, MA, US
Post-doctoral Research Fellow, Department of Medicine (Cardiovascular Division) 2010-present
Advisor: Dr. Reza Nezafat

Harvard University Cambridge, MA, US
Ph. D. in Engineering Sciences 2005-10
S. M. in Applied Mathematics
PhD Thesis: An Information Theoretic Approach to Compressed Sensing and Its Utility
in Magnetic Resonance Imaging
Advisor: Dr. Vahid Tarokh

McGill University Montreal, QC, Canada
B. Eng. In Electrical Engineering (Honours) with Great Distinction 2001-05
Minor in Computer Science
GPA: 3.99/4.00, Concentration: Telecommunications
Thesis: Iterative Maps, Nonlinear Dynamics, and Performance Evaluation for Turbo Codes

RESEARCH EXPERIENCE

Beth Israel Deaconess Medical Center, Harvard Medical School Boston, MA, US
Research Fellow, Department of Medicine (Cardiovascular Division) 2010-present
Research Assistant, Department of Medicine (Cardiovascular Division) 2009-10
Accurate reconstruction methods for accelerated cardiac MR from randomly undersampled data, as well as for other cardiac MR applications.

Harvard University Cambridge, MA, US
Research Assistant, School of Engineering and Applied Sciences 2005-10
Compressed sensing, theory of sparse representations, frame constructions, and fast recovery algorithms for high-dimensional problems.

McGill University Montreal, QC, Canada
Research Assistant, Department of Electrical and Computer Engineering 2004-05
Rapid methods of evaluating the performance of iterative decoding algorithms for turbo codes.

TEACHING EXPERIENCE

Harvard University Cambridge, MA, US
AM 106/206 Applied Algebra and Combinatorics (Teaching Assistant) Fall 2006
Recipient of *Certificate of Distinction in Teaching*

McGill University Montreal, QC, Canada
ECSE 303 Signals and Systems I (Teaching Assistant) Spring 2005

JOURNAL PUBLICATIONS

Submitted/Accepted Pending Revision

1. **M. Akçakaya**, H. Rayatzadeh, T. A. Basha, S. N. Hong, R. H. Chan, K. V. Kissinger, T. H. Hauser, M. E. Josephson, W. J. Manning and R. Nezafat, "Accelerated Late Gadolinium Enhancement Cardiac MRI with Isotropic Spatial Resolution Using Compressed Sensing: Initial Experience," *Radiology*, accepted pending revision.
2. **M. Akçakaya** and R. Nezafat, "Induced Structured-Sparsity for Improved Convex Compressed Sensing Reconstruction," *submitted*, 2011.
3. M. H. Moghari, T. A. Basha, S. N. Hong, R. H. Chan, J. Afilalo, H. Rayatzadeh, **M. Akçakaya**, K. V. Kissinger, B. Goddu, W. J. Manning and R. Nezafat, "Free-Breathing Late Gadolinium Enhancement with a Fixed Scan Time Using CosMo," *submitted*, 2011.
4. B. Babadi, **M. Akçakaya** and V. Tarokh, "An Information-Theoretic Universal Sufficiency Condition for Noisy Sparse Recovery," *submitted*, 2011.

Published/In press

5. **M. Akçakaya**^{*}, T. A. Basha^{*}, R. H. Chan, H. Rayatzadeh, K. V. Kissinger, B. Goddu, L. A. Goepfert, W. J. Manning and R. Nezafat, "Accelerated Contrast-Enhanced Whole Heart Coronary MRI using Low-dimensional-Structure Self-learning and Thresholding (LOST)," *Magnetic Resonance in Medicine*, in press (*: denotes co-first authorship).
6. S. Nam, **M. Akçakaya**, T. A. Basha, C. Stehning, W. J. Manning, V. Tarokh and R. Nezafat, "Compressed Sensing Reconstruction for Whole Heart Imaging with 3D Radial Trajectories: A GPU Implementation," *Magnetic Resonance in Medicine*, in press.
7. **M. Akçakaya**, T. A. Basha, B. Goddu, L. A. Goepfert, K. V. Kissinger, V. Tarokh, W. J. Manning and R. Nezafat, "Low-dimensional-Structure Self-Learning and Thresholding (LOST): Regularization Beyond Compressed Sensing for MRI Reconstruction," *Magnetic Resonance in Medicine*, 66(3), pp. 756-767, Sep 2011, [ISMRM I. I. Rabi Young Investigator Award Finalist](#) (PMID: 21465542).
8. M. H. Moghari, **M. Akçakaya**, A. O'Connor, T. A. Basha, M. Casanova, L. Goepfert, K. V. Kissinger, B. Goddu, M. L. Chuang, V. Tarokh, W. J. Manning and R. Nezafat, "Compressed-Sensing Motion Compensation (CosMo): A Joint Prospective-Retrospective Respiratory Navigator for Coronary MRI," *Magnetic Resonance in Medicine*, 66(6), pp. 1674-1681, Dec 2011 (PMID: 21671266).
9. **M. Akçakaya**, J. Park and V. Tarokh, "A Coding Theory Approach to Noisy Compressive Sensing Using Low Density Frames," *IEEE Trans. on Signal Processing*, 59(11), pp. 5369-5379, Nov. 2011.
10. **M. Akçakaya**, P. Hu, M. L. Chuang, T. H. Hauser, L. H. Ngo, W. J. Manning, V. Tarokh and R. Nezafat, "Accelerated Non-Contrast Enhanced Pulmonary Vein MRA with Distributed Compressed Sensing," *Journal of Magnetic Resonance Imaging*, 33(5), pp. 1248-1255, May 2011 (PMID: 21509886).
11. **M. Akçakaya**, S. Nam, P. Hu, M. H. Moghari, L. H. Ngo, V. Tarokh, W. J. Manning and R. Nezafat, "Compressed Sensing with Wavelet Domain Dependencies for Coronary MRI," *IEEE Trans. on Medical Imaging*, 30(5), pp.1090-1099, May 2011 (PMID: 21536523).
12. **M. Akçakaya** and V. Tarokh, "Shannon Theoretic Limits on Noisy Compressive Sampling," *IEEE Trans. on Information Theory*, 56(1), pp. 492-504, Jan. 2010.
13. **M. Akçakaya** and V. Tarokh, "A Frame Construction and A Universal Distortion Bound for Sparse Representations," *IEEE Trans. on Signal Processing*, 56(6), pp. 2443-2450, June 2008.
14. **M. Akçakaya** and V. Tarokh, "Performance of Sparse Representation Algorithms Using Randomly Generated Frames," *IEEE Signal Processing Letters*, 14(11), pp. 777-780, November 2007.
15. N. Mysore, J. Bajcsy, **M. Akçakaya** and H. Kobayashi, "A New Performance Evaluation Technique for Iteratively Decoded Magnetic Recording Systems," *IEEE Trans. on Magnetics*, 41(10), pp. 2986-2988, October 2005.

SELECTED CONFERENCE PUBLICATIONS

1. **M. Akçakaya**, H. Rayatzadeh, S. N. Hong, T. H. Hauser, R. H. Chan, T. A. Basha, K. V. Kissinger, B. Goddu, W. J. Manning and R. Nezafat, "Improved Late Gadolinium Enhancement Imaging of Left Ventricle with Isotropic Spatial Resolution," *Proc. 15th Scientific Sessions of SCMR*, 2012. SCMR Early Career Award Finalist (Basic Translational Research)
2. **M. Akçakaya**, S. N. Hong, R. H. Chan, T. A. Basha, M. H. Moghari, K. V. Kissinger, B. Goddu, M. E. Josephson W. J. Manning and R. Nezafat, "Left Atrial Scar Assessment using Imaging with Isotropic Spatial Resolution and Compressed Sensing," *Proc. 15th Scientific Sessions of SCMR*, 2012. SCMR Early Career Award Finalist (Basic Science Research)
3. S. Nam, **M. Akçakaya**, Y. Kwak, B. Goddu, K. V. Kissinger, M. E. Josephson W. J. Manning, V. Tarokh and R. Nezafat, "Improved Accelerated Breath-hold Radial Cine Image Reconstruction by Acquiring Additional Free-Breathing Data between Breath-holds," *Proc. 15th Scientific Sessions of SCMR*, 2012.
4. J. L. Shaw, M. H. Moghari, **M. Akçakaya**, R. H. Chan, W. J. Manning and R. Nezafat, "Improved Navigator-gated Motion Compensation in Cardiac MR Using Additional Constraint of Magnitude of Motion-Corrupted Data," *Proc. 15th Scientific Sessions of SCMR*, 2012.
5. **M. Akçakaya**, T. A. Basha, B. Goddu, L. Goepfert, K. V. Kissinger, V. Tarokh, W. J. Manning and R. Nezafat, "Low-dimensional-Structure Self-Learning and Thresholding (LOST): Regularization Beyond Compressed Sensing for MRI Reconstruction," *Proc. 19th Meeting of ISMRM*, Montreal, Canada, May 2011.
6. **M. Akçakaya**^{*}, S. Nam^{*}, T. A. Basha, V. Tarokh, W. J. Manning and R. Nezafat, "Iterative Compressed Sensing Reconstruction for 3D Non-Cartesian Trajectories without Gridding & Re-gridding at Every Iteration," *Proc. 19th Meeting of ISMRM*, Montreal, Canada, May 2011 (*: denotes co-first authorship).
7. T. A. Basha, **M. Akçakaya**, M. H. Moghari, K. V. Kissinger, B. Goddu, L. Goepfert, W. J. Manning and R. Nezafat, "Minimization of Imaging Artifacts from Profile Ordering of Randomly Selected k_y - k_z Lines for Prospective Compressed-Sensing Acquisition in 3D Segmented SSFP and GRE Imaging," *Proc. 19th Meeting of ISMRM*, Montreal, Canada, May 2011.
8. S. Nam, T. A. Basha, **M. Akçakaya**, C. Stehning, W. J. Manning, V. Tarokh and R. Nezafat, "A GPU Implementation of Compressed Sensing Reconstruction of 3D Radial (Kooshball) Acquisition for High-Resolution Cardiac MRI," *Proc. 19th Meeting of ISMRM*, Montreal, Canada, May 2011.
9. **M. Akçakaya**, S. Nam, P. Hu, V. Tarokh, W. J. Manning and R. Nezafat, "Compressed Sensing with Transform Domain Dependencies for Coronary MRI," *Proc. 18th Meeting of ISMRM*, Stockholm, Sweden, May 2010.
10. **M. Akçakaya**, P. Hu, V. Tarokh, W. J. Manning and R. Nezafat, "Non-Contrast Enhanced Pulmonary Vein MRA with Compressed Sensing," *Proc. 18th Meeting of ISMRM*, Stockholm, Sweden, May 2010.
11. M. H. Moghari^{*}, **M. Akçakaya**^{*}, A. O'Connor, P. Hu, V. Tarokh, W. J. Manning and R. Nezafat, "CoSMo: Compressed Sensing Motion Correction for Coronary MRI," *Proc. 18th Meeting of ISMRM*, Stockholm, Sweden, May 2010 (*: denotes co-first authorship).
12. **M. Akçakaya**, S. Nam, M. H. Moghari, P. Hu, W. J. Manning, V. Tarokh and R. Nezafat, "Accelerated Coronary MRI Using Compressed Sensing with Transform Domain Dependencies: A Feasibility Study," *Journal of Cardiovascular Magnetic Resonance*, 12 (Suppl 1), pp. 107-108, 2010.
13. **M. Akçakaya**, J. Park and V. Tarokh, "Low Density Frames for Compressive Sensing," *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, Dallas, Texas, March 2010.
14. **M. Akçakaya** and V. Tarokh, "Limits on Noisy Compressive Sampling in Linear and Sublinear Regimes," *Proc. Conference on Information Sciences and Systems*, Princeton, NJ, March 2008 (invited).
15. **M. Akçakaya** and V. Tarokh, "On Sparsity, Redundancy and Quality of Frame Representations," *Proceedings of the IEEE International Symposium on Information Theory*, Nice, France, June 2007.
16. **M. Akçakaya** and V. Tarokh, "Performance Study of Various Sparse Representation Methods Using Redundant Frames," *Proc. Conference on Information Sciences and Systems*, Baltimore, MD, March 2007.
17. N. Mysore, **M. Akçakaya**, J. Bajcsy and H. Kobayashi, "A New Performance Evaluation Technique for Iteratively Decoded Magnetic Recording Systems," *Proceedings of the IEEE International Magnetics Conference*, Nagoya, Japan, April 2005.

PATENTS

1. **M. Akçakaya** and R. Nezafat, "Method for Image Reconstruction using Low-dimensional-structure Self-learning and Thresholding," Provisional US Patent Pending.

SELECTED HONORS AND AWARDS

<i>Early Career Award Finalist (Basic Science Research)</i> - Finalist for original basic science research in cardiac MRI.	SCMR	2012
<i>Early Career Award Finalist (Basic Translational Research)</i> - Finalist for original basic translational research in cardiac MRI.	SCMR	2012
<i>Regional Scholarship</i>	SCMR	2012
<i>I. I. Rabi Young Investigator Award Finalist</i> - One of the three finalists for original technical research in magnetic resonance.	ISMRRM	2011
<i>Travel Award</i>	ISMRRM	2010-11
<i>John Parker Bequest Fellowship</i> - Awarded to outstanding Ph.D. students in natural sciences.	Harvard University	2008
<i>GSAS Merit Fellowship</i> - Awarded to one Ph.D. student in each department for outstanding academic performance.	Harvard University	2008
<i>Certificate of Distinction in Teaching</i> - For AM 106/206 Applied Algebra and Combinatorics.	Harvard University	2006
<i>Herbert S. Winokur, Jr. Fellowship in Decision Sciences</i> - Awarded to one Ph.D. student for outstanding performance in decision sciences	Harvard University	2006
<i>School of Engineering and Applied Sciences Fellowship</i>	Harvard University	2005
<i>Charles Michael Morssen Gold Medal</i> - Awarded to one graduating student in engineering for exceptional engineering promise	McGill University	2005
<i>Professor Gar Lam Yip Memorial Prize</i>	McGill University	2005
<i>James McGill Award</i>	McGill University	2004
<i>AAPN eMPOWR Research Award</i> - Awarded for excellence in undergraduate research	McGill University	2004
<i>Motorola Foundation Scholarship</i>	McGill University	2003
<i>Morris Wilson Scholarship</i>	McGill University	2001-05

PROFESSIONAL SERVICE

Reviewer for the journals *IEEE Transactions on Medical Imaging*, *Journal of Magnetic Resonance Imaging*, *IEEE Transactions on Image Processing*, *IEEE Transactions on Information Theory*, *IEEE Transactions on Signal Processing*, *IEEE Signal Processing Letters*, *IEEE Journal of Selected Topics in Signal Processing*, *Journal of Communications and Networks*.

Member of IEEE, ISMRRM, SCMR and SIAM.

PERSONAL

Citizenship: Turkey
Languages: Fluent in English, Turkish; Intermediate in French, Spanish
Interests: Rowing (Harvard Graduate School team captain, CRI member, Harvard Law School member), member of Harvard University Cycling Association, classical guitar