

## Eva L. Dyer

---

CONTACT INFORMATION	Department of Electrical & Computer Engineering Rice University, Houston, TX 77005 USA	<i>email:</i> e.dyer@rice.edu <i>html:</i> www.ece.rice.edu/~eld1
RESEARCH INTERESTS	Theoretical & computational neuroscience, theoretical models for sensory neural coding, signal processing for neural data analysis; low-dimensional signal models, unions of subspaces, sparse signal recovery; algorithms and architectures for distributed optimization.	
EDUCATION	<b>Rice University</b> , Houston, Texas <ul style="list-style-type: none"><li>• Ph.D. in Electrical &amp; Computer Engineering, <i>in progress</i></li><li>• M.S. in Electrical &amp; Computer Engineering, December 2011 Thesis title: “Endogenous Sparse Recovery” Thesis advisor: Richard G. Baraniuk</li></ul> <b>University of Miami</b> , Coral Gables, Florida <ul style="list-style-type: none"><li>• B.S. in Electrical &amp; Computer Engineering, May 2007 Double Major in Audio Engineering and Physics</li></ul>	
RESEARCH EXPERIENCE	<b>Rice University</b> , Houston, Texas <i>Research Assistant, Electrical &amp; Computer Engineering Dept.</i> <b>Aug 2007 – Present</b> Includes M.S. and Ph.D. research and course work, assistance in grant writing and reviewing papers.  <i>National Library of Medicine Predoctoral Fellow</i> <b>Jun 2008 – Jun 2010</b> Research fellow and trainee in W.M. Keck Center for Interdisciplinary Bioscience Training Program in Computational Biology & Medicine. Participated in annual Keck research conferences, weekly interdisciplinary bioscience seminars, and annual progress reviews.  <b>The Johns Hopkins University</b> , Baltimore, Maryland <i>Research Assistant, Center for Computer Integrated Surgical Syst.</i> <b>May 2006 – Jul 2006</b> Participated in a NSF Research Experience for Undergraduates (REU) program in the Engineering Research Center for Computer Integrated Surgical Systems & Technology (ERC-CISST). Conducted research with Dr. Gabor Fichtinger on the development of an electromagnetic tracking system to aid in validation of MR image overlay devices for minimally-invasive needle-insertion procedures.  <b>University of Miami</b> , Miami, Florida <i>Research Assistant, Electrical &amp; Computer Engineering Dept.</i> <b>Jun 2005 – Aug 2005</b> Conducted research with Dr. Manohar Murthi on all-pole speech modeling and recognition with the minimum-distortionless response (MVDR) spectrum. This research was funded by the NSF Research Experience for Undergraduates (REU) program.	

TEACHING  
EXPERIENCE

**Rice University**, Houston, Texas

*Guest Lecturer, Electrical & Computer Engineering Dept.*

**Apr 2013**

Guest lecture on "Introduction to Neural Information Processing"

- ELEC 431: Digital Signal Processing, Fall 2012.

*Teaching Fellow, Electrical & Computer Engineering Dept.*

**Aug 2012 – Dec 2012**

Guest lecturer, hold weekly office hours, and aid in preparation of tests and homework.

- ELEC 301: Signals & Systems, Fall 2012.

*Teaching Assistant, Electrical & Computer Engineering Dept.*

**Jan 2012 – Present**

Aid instructors in the development of course materials, assist students in course projects, and maintain course website.

- ELEC 631: Information Theory and Signal Processing Methods for Neuroengineering

*Teaching Fellow, Electrical & Computer Engineering Dept.*

**Aug 2009 – Dec 2011**

Hold weekly review/problem solving sessions, hold weekly office hours, and aid instructor in preparation of tests and homework.

- ELEC 303: Random Signals & Noise, Fall 2009, Fall 2010, Fall 2011.

*Grading Assistant, Electrical & Computer Engineering Dept.*

**Aug 2008 – May 2011**

- ELEC 241: Fundamentals of Electrical Engineering, Fall 2008.
- ELEC 431: Digital Signal Processing, Spring 2010, 2011.

**University of Miami**, Coral Gables, FL

*Grading Assistant, Electrical & Computer Engineering Dept.*

**Aug 2006 – May 2007**

- EEN 201 Circuit Theory, Fall 2006
- EEN 218 Intermediate Computer Programming, Fall 2006
- EEN 307 Linear Circuits & Signals, Spring 2006, 2007

*Peer tutor, Academic Resource Center*

**Oct 2004 – May 2007**

Peer tutor for courses in physics, math, electrical engineering, and Latin. Participated in courses on tutoring, mentoring, and educational psychology.

HONORS AND  
AWARDS

Best PhD Presenter, Dept. of Electrical & Computer Engineering, Rice University, April 2013

National Science Foundation Graduate Research Fellowship, 2010–2013 (awarded 2009)

National Library of Medicine Fellowship in Computational Biology & Medicine, 2008–2010

George R. Brown School of Engineering Presidential Fellowship, Rice University, 2007–2013

Texas Instruments Distinguished Graduate Fellowship, Rice University, 2007–2013

Outstanding Student in Electrical Engineering, Univ. of Miami Honors Convocation, 2007

Eliahu Jury Award for Undergraduate Scholarship in EE, University of Miami, 2007

C.V. Starr Scholarship, University of Miami, 2006–2007

John Farina Scholarship, University of Miami's College of Engineering, 2005–2007

Ann Bachellor Scholarship, University of Miami's College of Engineering, 2004–2005

JOURNAL  
PUBLICATIONS

**E.L. Dyer**, A.C. Sankaranarayanan, R.G. Baraniuk: Greedy Feature Selection for Subspace Clustering, *under review*.

CONFERENCE  
PUBLICATIONS

**E.L. Dyer**, C. Studer, R.G. Baraniuk: 'Subspace Clustering Reloaded: Sparse vs. Dense Representations', Signal Processing with Adaptive Sparse Structured Representations (SPARS) 2013 Proceedings, Lausanne, Switzerland, July 2013.

**E.L. Dyer**, C. Studer, R.G. Baraniuk: Subspace Clustering with Dense Representations, Int. Conf. on Acoustics, Speech, and Signal Processing (ICASSP) 2013.

**E.L. Dyer**, U. Rutishauser, R.G. Baraniuk: Group sparse coding with a collection of winner-take-all networks, Organization of Computational Neurosciences (OCNS) Proceedings, BMC Neuroscience 2012, 13(1):P184, July, 2012.

**E.L. Dyer**, A.C. Sankaranarayanan, R.G. Baraniuk: Learning hybrid linear models via sparse recovery. Signal Processing with Adaptive Sparse Structured Representations (SPARS) 2011 Proceedings, Edinburgh, Scotland, June, 2011.

**E.L. Dyer**, M. Majzoobi, F. Koushanfar: Hybrid Modeling of Non-Stationary Process Variations. ACM Design and Automation Conf. (DAC) 2011, San Diego, CA, June 5-10, 2011.

**E.L. Dyer**, M.F. Duarte, D.H. Johnson, R.G. Baraniuk: Recovering Spikes from Noisy Neuronal Calcium Signals via Structured Sparse Approximation. Lecture Notes in Computer Science, LVA/ICA 2010, Volume 6365/2010, 604-611.

M. Majzoobi, **E.L. Dyer**, A. Enably, F. Koushanfar: Rapid FPGA Characterization Using Clock Synthesis and Signal Sparsity. International Test Conference (ITC) 2010 Proceedings, Austin, TX, November 2010.

**E.L. Dyer**, D.H. Johnson, R.G. Baraniuk: Learning modular representations from global sparse coding networks. BMC Neuroscience 2010, 11:P131.

**E.L. Dyer**, D.H. Johnson, R.G. Baraniuk: Sparse coding in modular networks. COSYNE 2010, Salt Lake City, 2010.

**E.L. Dyer**, D.H. Johnson, R.G. Baraniuk: Sparse coding with population sketches, BMC Neuroscience 2009, 10(1):P132.

G. Fischer, **E.L. Dyer**, C. Csoma, A. Deguet, G. Fichtinger: Validation System for MR Image Overlay and Other Needle Insertion Techniques, Medicine Meets Virtual Reality 15- in vivo, in vitro, in silico: Designing the Next in Medicine, IOS Press, 2007.

SHORT COURSES  
& WORKSHOPS

*Future Faculty Workshop* for Late-Stage Ph.D. Students and Postdoctoral Scholars, Rice University, Houston, TX, November 27-28, 2012.

Capocaccia Workshop for *Neuromorphic Engineering*, Sardinia, Italy, May 2012.

Fourth Annual Winedale Workshop on *Networks & Optimization*, Winedale Conference Center, Round Top, Texas, October 15, 2011.

Workshop on *Signal Processing with Adaptive Sparse Structured Representations* (SPARS), Edinburgh, Scotland, June 2011.

Women in Mathematics Summer Program on *Sparsity and Computation*, Institute for Advanced Studies, Princeton University, Princeton, New Jersey, USA, May 16–27 2011.

Sparse Models, Algorithms, and Learning for Large-scale data (SMALL) Workshop on *Sparse Dictionary Learning*, Queen Mary University of London, London, UK, January 6–7, 2011.

Third Annual Winedale Workshop on *High-dimensional Statistical Problems*, Winedale Conference Center, Round Top, Texas, October 15, 2010.

Interdisciplinary Workshop on *Modern Mathematical Methods for High-Dimensional Data*, Vrije Universiteit Brussel, Brussels, Belgium, April 6–10, 2010.

*Wavelets Mini Course*, Electrical & Computer Engineering Department, Rice University, May 20–21, 2009.

Workshop on *Nonlinear Approximation Techniques using L1*, Department of Mathematics, Texas A&M University, College Station, Texas, May 16–18, 2008.

#### TALKS

“Compressed Message Passing for BIG Data”, ECE Annual Affiliates Meeting, Rice University, April 3, 2013 (*invited*)

“Learning Low-Rank Representations from Collections of High-Dimensional Data”, Rice University, Computational and Applied Math Department Pre-Colloquium Seminar, October 17, 2011 (*invited*)

“Learning Hybrid Linear Models from Data Ensembles”, Technical University of Delft, Telecom Colloquium, July 7, 2011 (*invited*)

“Learning Hybrid Linear Models via Sparse Recovery”, SPARS 2011 Workshop, Edinburgh, Scotland, June 30, 2011 (*accepted*)

“Hybrid Modeling of Non-Stationary Process Variations”, ACM Design and Automation Conference (DAC) 2011, San Diego, CA, June 5 - 10, 2011 (*accepted*)

“Exploiting Dispersive Structure in Sparse Spike Recovery”, University of Edinburgh, Institute for Digital Communications (IDCOM) Seminar, January 11, 2011 (*invited*)

“Spike Recovery with Structured Sparse Approximation”, Latent Variable Analysis & Signal Separation (LVA/ICA 2010), Saint Malo, France, September 30, 2010 (*accepted*)

“Sparse Coding in Modular Networks”, Interdisciplinary Workshop on Modern Mathematical Methods for High-Dimensional Data, Vrije Universiteit Brussel, Brussels, Belgium, April 7, 2010 (*accepted*)

“Structured Sparse Coding in the Striate Cortex”, 19th Keck Center Annual Research Conference, M.D. Anderson Cancer Prevention Building, Houston, TX, October 30, 2009 (*invited*)

#### PROFESSIONAL ACTIVITIES

- Reviewer for Signal Processing Letters, IEEE Transactions on Signal Processing, IEEE Transactions on Information Theory, International Symposium on Information Theory (ISIT), Neural Information Processing Systems (NIPS)
- Student member of IEEE and Society for Industrial & Applied Mathematics (SIAM)
- Member of Eta Kappa Nu Honor Society

- President and web designer for Rice University ExCEL (Graduate Women in Electrical and Computer Engineering)