Ethan R. Elenberg

CONTACT INFORMATION

The University of Texas
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RESEARCH INTERESTS

Graph Algorithms, Distributed Storage, Image Processing, Index Coding

EDUCATION

The University of Texas, Austin, TX

Ph.D., Electrical and Computer Engineering

M.S., Electrical and Computer Engineering, May 2014 GPA: 3.85/4.0

- Research Supervisors: Sriram Vishwanath and Alexandros G. Dimakis
- Academic Track: Communications, Networks, and Systems (CommNetS)

The Cooper Union for the Advancement of Science and Art, New York, NY

B.E., Electrical Engineering, May 2012 GPA: 4.0/4.0

- Full Tuition Scholarship, 2008-2012
- *Summa Cum Laude*
- Signal Processing & Communications Track
- Minor in Mathematics

SECURITY CLEARANCE

Last active August 2014, information available upon request.

WORK EXPERIENCE

Graduate Research Assistant, The University of Texas *August 2013 - Present*

- Member of Wireless Networking & Communications Group, LINC group.
- Designing distributed approximation algorithms for graph analytics.
- Developing tools to analyze and visualize brain connectivity using task-based fMRI.

Summer Research Intern, MIT Lincoln Laboratory *May 2014 - August 2014*

- Formulated and developed novel entropy-based autofocus algorithms for nearfield SAR.
- Evaluated performance on simulated, emulated, and measured SAR data.

Wireless Intern, Apple *May 2013 - August 2013*

- Developed an EVM analysis tool for cellular QPSK signals.
- Provided factory support during an iPhone build.

Summer Research Intern, MIT Lincoln Laboratory *June 2012 - August 2012*

- Implemented extended and unscented Kalman filters in MATLAB for passive target tracking applications.
- Developed and tested a proof-of-concept passive RF direction finding circuit.

S*PROCOM ^{2} Research Fellow, The Cooper Union *August 2011 - May 2012*

- Assisted with Cognitive Communications Gateway Engine software development.
- Implemented Voice over IP transcoding for software defined radio applications.

Student Engineer, Southwest Research Institute *May 2011 - August 2011*

- Developed image processing software in C for a 4-slap fingerprint reader.
- Assisted in mapping high-level algorithms to an embedded FPGA implementation.
- Implemented adaptive filtering, AR inverse model, and NPR filter bank algorithms in MATLAB for audio processing.

Audio/Visual Technician, The Cooper Union *September 2008 - May 2011*

- Operated sound for Great Hall events and audio/visual equipment for classes.
- Supervised movement of equipment to the New Academic Building.

Quantitative Research Intern, The Millburn Corporation *May 2010 - January 2011*
- ◇ Developed financial models and parallel computing clusters in both R and S-PLUS.

Math Tutor, The Cooper Union *October 2009 - February 2010*
- ◇ Assisted individual students with Intro to Linear Algebra concepts and homework.

TECHNICAL SKILLS

- ◇ **Programs:** Cygwin, Git, GNU Radio, GraphLab PowerGraph, MATLAB, Mercurial, MPLAB, Microsoft Office, Perforce, S-PLUS, Spark, SPICE, Spyder, TinyOS, Visual C#, Xcode, Xilinx ISE, Unix Shell
- ◇ **Languages:** C, C++, CUDA C, Motorola DSP 563xx assembly, HTML, LaTeX, NumbaPro, Objective C, PIC assembly, Python, R, Scala, VHDL
- ◇ **Algorithms:** Adaptive filtering, backprojection imaging, correlation clustering, CoSaMP, graph-based visual saliency, image interpolation, k-means clustering, locality sensitive hashing, Luby transform coding, nonlinear Kalman filtering, 802.11 Physical Layer, sparse PCA, support vector machines, triangle counting, WiMAX Physical Layer, zig-zag and replacement product
- ◇ **Laboratory:** Digital multimeter, oscilloscope, vector network analyzer, wideband communication tester

PUBLICATIONS

[1] **E.R. Elenberg**, K. Shanmugam, M. Borokhovich, and A.G. Dimakis. "Distributed Estimation of Graph 4-profiles", in *Proc. World Wide Web Conference*, 2016 (to appear).

[2] **E.R. Elenberg**, K. Shanmugam, M. Borokhovich, and A.G. Dimakis. "Beyond Triangles: A Distributed Framework for Estimating 3-profiles of Large Graphs", in *Proc. ACM KDD*, August 2015.

[3] J.I. Tamir, **E.R. Elenberg**, A. Banerjee, and S. Vishwanath. "Wireless Index Coding Through Rank Minimization", in *Proc. IEEE ICC*, Sydney, Australia, June 2014.

[4] J.L. Baylon, **E.R. Elenberg**, and S.G. Massengill. "iSCISM: interference Sensing and Coexistence in the ISM Band", *High Frequency Electronics*, vol. 11 no. 4 pp. 30-46, Apr. 2012.

PRESENTATIONS

[5] J.L. Baylon, **E.R. Elenberg**, and S.G. Massengill. "iSCISM: interference Sensing and Coexistence in the ISM Band," *2012 NEWSDR Workshop*, Boston, MA. Poster.

ACADEMIC WORK

- ◇ Triangle Sparsifier Bounds via Stein's Method — Fall 2015
- ◇ A Distributed Framework for Estimating k-profiles of Large Graphs — 2014-2015
- ◇ Video Saliency: Algorithms and Architectures — Spring 2014
- ◇ Locality Sensitive Hashing Families for Large-Scale Image Compression — 2013-2014
- ◇ Multihop Interference Alignment — Spring 2013
- ◇ Dimensionality Reduction with Expander Graphs — Fall 2012
- ◇ iSCISM: interference Sensing and Coexistence in the ISM band — 2011-2012
  - – *First Place* - IEEE Region 1 Student Paper Competition
  - – Sponsored by *ITT Exelis*
- ◇ Rateless LT Code Simulation for Visible Light Communication Channels — Spring 2012
- ◇ Performance Evaluation of WiMAX in Urban Fading Channels — Spring 2012
- ◇ MATLAB Implementation of MPEG-1 Audio Layer 1 Compression — Fall 2010
- ◇ Development of a Vinyl Playback Simulator — 2010
- ◇ Construction of a Morse Code Decoder — Spring 2009

GRADUATE COURSEWORK

Adaptive Filters, Advanced Probability, Classical Coding Theory, Digital Video, Introduction to Compressive Sensing, Introduction to System Theory, Large-Scale Learning, Optoelectronic Devices, Postmodern Coding Theory, Probability & Random Processes I, Randomized Algorithms, Wavelets & Multiresolution Imaging, Wireless Communications, Wireless System Design

HONORS AND AWARDS

The University of Texas

- Cockrell School Fellowship — 2012-Present
- Microelectronics & Computer Development Fellowship — 2012-2013

The Cooper Union

- Dean's List — Fall 2008 - Spring 2012
- Harold S. Goldberg Leadership Prize — May 2012
- Irwin L. Lynn Memorial Prize in Mathematics — May 2012
- Radio Club of America Scholarship — March 2012
- Abdul Azimi Memorial Scholarship — November 2011
- C.V. Starr Scholarship — October 2011
- Jesse Sherman Book Award in Electrical Engineering — September 2011
- Barry Federman SAME Scholarship — October 2010

MEMBERSHIPS

- Student Member, IEEE — 2011-Present
- Reviewer, NIPS — 2015
- Reviewer, DySPAN — 2014
- Reviewer, Globecom Communication Theory Symposium — 2013
- Member, Tau Beta Pi — 2010-Present
- Member, Order of the Engineer — 2012-Present
- President, Eta Kappa Nu — 2011-2012
- President, Pro Musica — 2010-2012
- Musical Director, Cooper Dramatic Society — 2009-2011