# Ethan R. Elenberg


CONTACT INFORMATION

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OBJECTIVE

Full-time or Internship position that allows for research in the areas of Graph Algorithms, Machine Learning, Image Processing, and Distributed Storage.

EDUCATION

**The University of Texas at Austin**, Austin, TX
- ◇ Ph.D., Electrical and Computer Engineering, 2017 (Expected)
- ◇ M.S., Electrical and Computer Engineering, May 2014 GPA: 3.9/4.0
  - – 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, *Summa Cum Laude*, May 2012 GPA: 4.0/4.0
  - – Signal Processing & Communications Track
  - – Minor in Mathematics

**Relevant Graduate Coursework:** Adaptive Filters, Advanced Probability, Classical Coding Theory, Digital Video, Introduction to Compressive Sensing, Machine Learning for Large-Scale Data, Postmodern Coding Theory, Randomized Algorithms

WORK EXPERIENCE

**Graduate Research Assistant, The University of Texas** *August 2013 - Present*
- ◇ Design distributed approximation algorithms for graph analytics.
- ◇ Develop tools to analyze and visualize brain connectivity using task-based fMRI.
- ◇ Establish performance guarantees for high-dimensional, greedy feature selection.

**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.

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

TECHNICAL SKILLS

**Programs:** Cygwin, Git, GNU Radio, MATLAB, Mercurial, Microsoft Office, Perforce, Spark, SPICE, Xcode, Xilinx ISE, Unix Shell

**Languages:** C, C++, CUDA C, Motorola DSP 563xx assembly, HTML, LaTeX, Objective C, PIC assembly, Python, R, Scala, VHDL

**Frameworks:** GraphLab PowerGraph, NumbaPro, NumPy, Pandas, scikit-learn, TinyOS

## TECHNICAL SKILLS (CONTINUED)

**Algorithms:** Backprojection imaging, correlation clustering, CoSaMP, graph-based visual saliency, greedy forward regression, $k$-means clustering, locality sensitive hashing, Luby transform coding, nonlinear Kalman filtering, 802.11 Physical Layer, sparse PCA, stochastic gradient descent, support vector machines, triangle counting

**Laboratory:** Digital multimeter, oscilloscope, vector network analyzer, wideband communication tester

**Security Clearance:** Last active August 2014, information available upon request

## SELECTED PUBLICATIONS AND PRESENTATIONS

A. Bonato, D.R. D'Angelo, **E.R. Elenberg**, D.F. Gleich, and Y. Hou. "Mining and Modeling Character Networks", in *Proc. WAW 2016* (to appear).

**E.R. Elenberg**, K. Shanmugam, M. Borokhovich, and A.G. Dimakis. "Distributed Estimation of Graph 4-profiles", in *Proc. World Wide Web Conference*, April 2016.

**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.

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.

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.

"Graph Profiles: Algorithms and Approximation Guarantees", *2016 SIAM Conference on Discrete Mathematics*, Atlanta, GA. Invited Speaker.

"Kaggle Competitions." EE379K: Architectures for (Big) Data Science, UT Austin, Spring 2016. Guest Lecture.

## ACADEMIC WORK

| | |
|---|---|
| Restricted Strong Convexity and Weak Submodularity | 2016 |
| 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 |
| iSCISM: interference Sensing and Coexistence in the ISM band<br>– *First Place* - IEEE Region 1 Student Paper Competition<br>– Sponsored by *ITT Exelis* | 2011-2012 |
| MATLAB Implementation of MPEG-1 Audio Layer 1 Compression | Fall 2010 |

## HONORS AND AWARDS

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| Cockrell School Fellowship | 2012-2016 |
| Microelectronics & Computer Development Fellowship | 2012-2013 |
| Cooper Union Full Tuition Scholarship | 2008-2012 |
| Harold S. Goldberg Leadership Prize | May 2012 |
| Irwin L. Lynn Memorial Prize in Mathematics | May 2012 |

## MEMBERSHIPS

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|---|---|
| Reviewer: ISIT 2016, NIPS 2015, DySPAN 2014, Globecom 2013 | |
| Student Member, IEEE | 2011-Present |
| 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 |