Ethan R. Elenberg

CONTACT
INFORMATION

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OBJECTIVE

Full-time position that allows for research experience in the areas of large-scale Combinatorial Optimization, Interpretable Machine Learning, and/or Graph Algorithms.

EDUCATION

The University of Texas at Austin, Austin, TX
⋄ Ph.D., Electrical and Computer Engineering, May 2018 (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 subgraph counting and graph analytics.
⋄ Establish performance guarantees for nonlinear, large-scale, greedy feature selection.
⋄ Develop interpretability measures for black-box models via combinatorial optimization.

Summer Intern, Twitter   *May 2017 - August 2017*
⋄ Designed and evaluated large-scale hashing algorithms to compute approximate, local subgraph features.
⋄ Improved machine learning pipelines for sending personalized email recommendations.

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.

TECHNICAL
SKILLS

Programs: Cygwin, Git, GNU Radio, Gunicorn, IntelliJ, 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

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TECHNICAL SKILLS (CONTINUED)	**Frameworks:** Flask, GraphLab, Keras, NumPy, Pandas, Scalding, scikit-learn, TensorFlow,
	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
	Security Clearance: Last active August 2014, information available upon request

SELECTED PUBLICATIONS AND PRESENTATIONS	**E.R. Elenberg**, A.G. Dimakis, M. Feldman, and A. Karbasi. "Streaming Weak Submodularity: Interpreting Neural Networks on the Fly", in *Proc. NIPS*, 2017. **Oral Presentation**.
	R. Khanna, **E.R. Elenberg**, A.G. Dimakis, and S. Negahban. "On Approximation Guarantees for Greedy Low Rank Approximation", in *Proc. ICML*, August 2017.
	R. Khanna, **E.R. Elenberg**, A.G. Dimakis, S. Negahban, and J. Ghosh. "Scalable Greedy Feature Selection via Weak Submodularity", in *Proc. AISTATS*, April 2017.
	E.R. Elenberg, R. Khanna, A.G. Dimakis, and S. Negahban. "Restricted Strong Convexity Implies Weak Submodularity", in *Proc. NIPS Workshop on Learning in High Dimensions with Structure*, December 2016. Oral Presentation. (Journal version in preparation)
	E.R. Elenberg, K. Shanmugam, M. Borokhovich, and A.G. Dimakis. "Distributed Estimation of Graph 4-profiles", in *Proc. WWW*, 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.
	"Streaming Weak Submodularity: Interpreting Neural Networks on the Fly", *Texas A&M University Information Science and Systems Seminar*, College Station TX, Fall 2017.
	"Machine Learning on Graphs: Profiles and Greedy Approximation", *2017 SIAM Conference on Optimization*, Vancouver, BC. Invited Speaker.
	"Kaggle Competitions." EE379K: Architectures for (Big) Data Science, UT Austin, Spring 2016. Guest Lecture.

ACADEMIC WORK	Neural Network Interpretability via Streaming Weak Submodularity — 2017
	Restricted Strong Convexity and Weak Submodularity — 2016-2017
	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 — 2011-2012
	− *First Place* - IEEE Region 1 Student Paper Competition
	MATLAB Implementation of MPEG-1 Audio Layer 1 Compression — Fall 2010

HONORS AND AWARDS	ICML Student Travel Award — 2017
	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	Reviewer: NIPS 2015-2017, AISTATS 2017, IEEE Transactions on Information Theory, IEEE/ACM Transactions on Networking, Knowledge and Information Systems, Internet Mathematics, ISIT 2016, Globecom 2013
	Student Member, IEEE — 2011-Present
	Member, Tau Beta Pi — 2010-Present
	Member, Order of the Engineer — 2012-Present
	President: Eta Kappa Nu, Pro Musica, Cooper Dramatic Society — 2010-2012