

Ethan R. Elenberg

CONTACT INFORMATION	201-892-4615 elenberg@utexas.edu http://eelenberg.github.io	3200 Tom Green Street Apartment A Austin, TX 78705
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	<p>The University of Texas at Austin, Austin, TX</p> <ul style="list-style-type: none">◇ Ph.D., Electrical and Computer Engineering, May 2018 (Expected)◇ M.S., Electrical and Computer Engineering, May 2014 GPA: 3.9/4.0<ul style="list-style-type: none">– Research Supervisors: Sriram Vishwanath and Alexandros G. Dimakis– Academic Track: Communications, Networks, and Systems (CommNetS) <p>The Cooper Union for the Advancement of Science and Art, New York, NY</p> <ul style="list-style-type: none">◇ B.E., Electrical Engineering, <i>Summa Cum Laude</i>, May 2012 GPA: 4.0/4.0<ul style="list-style-type: none">– Signal Processing & Communications Track– Minor in Mathematics <p>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</p>	
WORK EXPERIENCE	<p>Graduate Research Assistant, The University of Texas <i>August 2013 - Present</i></p> <ul style="list-style-type: none">◇ 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. <p>Summer Intern, Twitter <i>May 2017 - August 2017</i></p> <ul style="list-style-type: none">◇ Designed and evaluated large-scale hashing algorithms to compute approximate, local subgraph features.◇ Improved machine learning pipelines for sending personalized email recommendations. <p>Summer Research Intern, MIT Lincoln Laboratory <i>May 2014 - August 2014</i></p> <ul style="list-style-type: none">◇ Formulated and developed novel entropy-based autofocus algorithms for nearfield SAR.◇ Evaluated performance on simulated, emulated, and measured SAR data. <p>Wireless Intern, Apple <i>May 2013 - August 2013</i></p> <ul style="list-style-type: none">◇ Developed an EVM analysis tool for cellular QPSK signals.◇ Provided factory support during an iPhone build. <p>Summer Research Intern, MIT Lincoln Laboratory <i>June 2012 - August 2012</i></p> <ul style="list-style-type: none">◇ 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. <p>S*PROCOM² Research Fellow, The Cooper Union <i>August 2011 - May 2012</i></p> <ul style="list-style-type: none">◇ Assisted with Cognitive Communications Gateway Engine software development.◇ Implemented Voice over IP transcoding for software defined radio applications. <p>Student Engineer, Southwest Research Institute <i>May 2011 - August 2011</i></p> <ul style="list-style-type: none">◇ 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	<p>Programs: Cygwin, Git, GNU Radio, Gunicorn, IntelliJ, MATLAB, Mercurial, Microsoft Office, Perforce, Spark, SPICE, Xcode, Xilinx ISE, Unix Shell</p> <p>Languages: C, C++, CUDA C, Motorola DSP 563xx assembly, HTML, \LaTeX, Objective C, PIC assembly, Python, R, Scala, VHDL</p>	

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TECHNICAL SKILLS (CONTINUED)	<p>Frameworks: Flask, GraphLab, Keras, NumPy, Pandas, Scalding, scikit-learn, TensorFlow,</p> <p>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</p> <p>Security Clearance: Last active August 2014, information available upon request</p>	
SELECTED PUBLICATIONS AND PRESENTATIONS	<p>E.R. Elenberg, R. Khanna, A.G. Dimakis, and S. Negahban. “Restricted Strong Convexity Implies Weak Submodularity”, to appear in <i>Annals of Statistics</i>, 2018.</p> <p>E.R. Elenberg, A.G. Dimakis, M. Feldman, and A. Karbasi. “Streaming Weak Submodularity: Interpreting Neural Networks on the Fly”, in <i>Proc. NIPS</i>, 2017. Oral Presentation.</p> <p>R. Khanna, E.R. Elenberg, A.G. Dimakis, and S. Negahban. “On Approximation Guarantees for Greedy Low Rank Approximation”, in <i>Proc. ICML</i>, August 2017.</p> <p>R. Khanna, E.R. Elenberg, A.G. Dimakis, S. Negahban, and J. Ghosh. “Scalable Greedy Feature Selection via Weak Submodularity”, in <i>Proc. AISTATS</i>, April 2017.</p> <p>E.R. Elenberg, K. Shanmugam, M. Borokhovich, and A.G. Dimakis. “Distributed Estimation of Graph 4-profiles”, in <i>Proc. WWW</i>, April 2016.</p> <p>E.R. Elenberg, K. Shanmugam, M. Borokhovich, and A.G. Dimakis. “Beyond Triangles: A Distributed Framework for Estimating 3-profiles of Large Graphs”, in <i>Proc. ACM KDD</i>, August 2015.</p> <p>“Streaming Weak Submodularity: Interpreting Neural Networks on the Fly”, <i>Texas A&M University Information Science and Systems Seminar</i>, College Station TX, Fall 2017.</p> <p>“Machine Learning on Graphs: Profiles and Greedy Approximation”, <i>2017 SIAM Conference on Optimization</i>, Vancouver, BC. Invited Speaker.</p> <p>“Kaggle Competitions.” EE379K: Architectures for (Big) Data Science, UT Austin, Spring 2016. Guest Lecture.</p>	
ACADEMIC WORK	<p>Neural Network Interpretability via Streaming Weak Submodularity 2017</p> <p>Restricted Strong Convexity and Weak Submodularity 2016-2017</p> <p>A Distributed Framework for Estimating k-profiles of Large Graphs 2014-2015</p> <p>Video Saliency: Algorithms and Architectures Spring 2014</p> <p>Locality Sensitive Hashing Families for Large-Scale Image Compression 2013-2014</p> <p>iSCISM: interference Sensing and Coexistence in the ISM band 2011-2012</p> <p>– <i>First Place</i> - IEEE Region 1 Student Paper Competition</p> <p>MATLAB Implementation of MPEG-1 Audio Layer 1 Compression Fall 2010</p>	
HONORS AND AWARDS	<p>ICML Student Travel Award 2017</p> <p>Cockrell School Fellowship 2012-2016</p> <p>Microelectronics & Computer Development Fellowship 2012-2013</p> <p>Cooper Union Full Tuition Scholarship 2008-2012</p> <p>Harold S. Goldberg Leadership Prize May 2012</p> <p>Irwin L. Lynn Memorial Prize in Mathematics May 2012</p>	
MEMBERSHIPS	<p>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</p> <p>Student Member, IEEE 2011-Present</p> <p>Member, Tau Beta Pi 2010-Present</p> <p>Member, Order of the Engineer 2012-Present</p> <p>President: Eta Kappa Nu, Pro Musica, Cooper Dramatic Society 2010-2012</p>	