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 Graph Algorithms, Combinatorial Optimization, Feature Selection, and/or Machine Learning.

EDUCATION

The University of Texas at Austin, Austin, TX
- ◇ Ph.D., Electrical and Computer Engineering, Spring 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 graph analytics.
- ◇ Use tools from combinatorial optimization to prove performance guarantees of greedy algorithms for sparse regression and interpretability of black-box models.

Summer Intern, Twitter *May 2017 - August 2017*
- ◇ Design and evaluate large-scale algorithms to compute approximate subgraph features.
- ◇ Improve machine learning pipelines for 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, 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

Frameworks: GraphLab PowerGraph, NumPy, Pandas, Scalding, 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

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

SELECTED PUBLICATIONS AND PRESENTATIONS

R. Khanna, **E.R. Elenberg**, A.G. Dimakis, and S. Negahban. "On Approximation Guarantees for Greedy Low Rank Approximation", in *Proc. ICML*, 2017.

R. Khanna, **E.R. Elenberg**, A.G. Dimakis, S. Negahban, and J. Ghosh. "Scalable Greedy Feature Selection via Weak Submodularity", in *Proc. AISTATS*, 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.

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

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.

"Machine Learning on Graphs: Profiles and Greedy Approximation", *2017 SIAM Conference on Optimization*, Vancouver, BC. Invited Speaker.

"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

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 – *First Place* - IEEE Region 1 Student Paper Competition – Sponsored by *ITT Exelis*	2011-2012
MATLAB Implementation of MPEG-1 Audio Layer 1 Compression	Fall 2010

HONORS AND AWARDS

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: Internet Mathematics, AISTATS 2017, ISIT 2016, NIPS 2015-2017, 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, Pro Musica, Cooper Dramatic Society	2010-2012