GAIL ROSEN's CURRICULUM VITAE

0.1 Current position

Rank: Associate Professor
Primary Department: Electrical and Computer Engineering
Affiliated Department: School of Biomedical Engineering, Science & Health Systems
Centers: Director of the Center for Biological Discovery from Big Data (BD^2)
Laboratories: Director, Ecological and Evolutionary Signal-processing and Informatics (EESI) Laboratory

0.2 Contact Information

Office Address: Department of Electrical and Computer Engineering
Drexel University
3141 Chestnut St., Bossone 403
Philadelphia, PA 19104
Office Phone: 404-247-6660
E-mail: gail.l.rosen@gmail.com
Personal URL: `http://www.ece.drexel.edu/gailr`
BD^2 Center URL: `http://biomed.drexel.edu/labs/biodiscovery/`
Laboratory URL: `http://www.ece.drexel.edu/gailr/EESI`

0.3 Education

2006 Ph.D. in Electrical and Computer Engineering
Georgia Institute of Technology, Atlanta, GA
Advisor: Jennifer Hasler

2002 M.S. in Electrical and Computer Engineering
Georgia Institute of Technology, Atlanta, GA

1999 B.S. in Electrical and Computer Engineering
Georgia Institute of Technology, Atlanta, GA

0.4   Employment

2013-Present	Associate Professor
	Department of Electrical and Computer Engineering
	Drexel University, Philadelphia, PA
2015-2016	Visiting Scholar
	Institute for Computational Biomedicine
	Weill Cornell Medicine, New York, NY
2006-2013	Assistant Professor
	Department of Electrical and Computer Engineering
	Drexel University, Philadelphia, PA
2000-2006	Graduate Research and Teaching Assistant
	School of Electrical and Computer Engineering
	Georgia Institute of Technology, Atlanta, GA
2004	Summer Intern
	MIT Lincoln Laboratories
	Boston, MA
2000	Summer Intern
	AT&T Research Laboratories
	Florham Park, NJ
1997-1998	Associate Engineer
	Scientific-Atlanta, Inc.
	Atlanta, GA
1995-1997	Co-op
	Georgia Tech Research Institute
	Atlanta, GA

0.5   Publications

Total Published:	79
Journal Papers:	35
Patent:	1
Conference Papers:	38
Book Chapters/Thesis:	5

(* denotes undergraduate author)

0.5.1 Refereed Journals: 35

1. Greg Ditzler, Robi Polikar, and **Gail L Rosen**. "A Sequential Learning Approach for Scaling Up Filter-Based Feature Subset Selection," *IEEE Transactions on Neural Networks and Learning Systems*, 2018.

2. Travers Ching, Daniel S. Himmelstein, ..., **Gail L. Rosen**, ... and many others with Casey Greene. "Opportunities and obstacles for deep learning in biology and medicine," *J. R. Soc. Interface*, April 2018.

3. N. B. O?Hara, H. J. Reed, E. Afshinnekoo, D. Harvin, N. Caplan, G. Rosen, B. Frye, S. Woloszynek, R. Ounit, S. Levy, E. Butler, C. E. Mason. "Metagenomic characterization of ambulances across the USA," *Microbiome*, 2017.

4. A. McIntyre and others with **Gail Rosen** and Chris Mason. "Comprehensive benchmarking and ensemble approaches for metagenomic classifiers," *Genome Biology*, 2017.

5. G Ditzler, J LaBarck, J Ritchie, **G Rosen**, R Polikar. "Extensions to Online Feature Selection Using Bagging and Boosting," *IEEE transactions on neural networks and learning systems*, 2017.

6. Alexa B R McIntyre, Lindsay Rizzardi, Angela M Yu, Noah Alexander, **Gail L Rosen**, Douglas J Botkin, Sarah E Stahl, Kristen K John, Sarah L Castro-Wallace, Ken McGrath, Aaron S Burton, Andrew P Feinberg and Christopher E Mason. "Nanopore sequencing in microgravity," *Nature Microgravity*, 2(16035), Oct. 2016.

7. Yemin Lan, **Gail Rosen**, and Ruth Hershberg. "Marker genes that are less conserved in their sequences are useful for predicting genome-wide similarity levels between closely related prokaryotic strains," *Microbiome Journal*, 4(1), May 2016.

8. Jacob R Price, Saeed Keshani Langroodi, Yemin Lan, Jonas M Becker, Wen K Shieh, **Gail L Rosen**, and Christopher M Sales. "Emerging investigators series: untangling the microbial ecosystem and kinetics in a nitrogen removing photosynthetic high density bioreactor," *Environmental Science: Water Research & Technology*, 2016.

9. Gregory Ditzler, J Calvin Morrison*, Yemin Lan, and **Gail L Rosen**. "Fizzy: feature subset selection for metagenomics," *BMC Bioinformatics*, 16(1), Nov. 2015.

10. Gregory Ditzler, Robi Polikar, and **Gail Rosen**. "Multi-Layer and Recursive Neural Networks for Metagenomic Classification," *IEEE Transactions on Nanobioscience*, 14(6), 608-616, Sept. 2015.

11. Erin Reichenberger, **Gail Rosen**, Uri Hershberg, and Ruth Hershberg. "Prokaryotic nucleotide composition is shaped by both phylogeny and the environment," *Genome Biology and Evolution*, May 2015.

12. Greg Ditzler, Robi Polikar, and **Gail Rosen**. "A Bootstrap Based Neyman-Pearson Test for Identifying Variable Importance," *IEEE Trans. on Neural Networks and Learning Systems*, April 2015.

13. Steven Essinger, Erin Reichenberger, J. Calvin Morrison*, Christopher Blackwood, and **Gail Rosen**. "A Toolkit for ARB to Integrate Custom Databases and Externally Built Phylogenies," *PLoS ONE*, Jan. 2015.

14. Loni Philip-Tabb, Wei Zhao, Jingyu Huang, and **Gail Rosen**. "Characterizing the Empirical Distribution of Prokaryotic Genome n-mers in the Presence of Nullomers," *Journal of Computational Biology*, October 2014.

15. David Koslicki, Simon Foucart, and **Gail Rosen**. "WGSQuikr: Fast whole-genome shotgun metagenomic classification," *PLoS ONE*, March 2014.

16. Yemin Lan, Calvin Morrison*, Ruth Hershberg, and **Gail Rosen**. "POGO-DB–a database of pairwise-comparisons of genomes and conserved orthologous genes," *Nucleic Acids Research*, Jan. 2014.

17. David Koslicki, Simon Foucart, and **Gail Rosen**. "Quikr: a method for rapid reconstruction of bacterial communities via compressive sensing," *Bioinformatics*, Sept. 2013.

18. Jason Silverman, **Gail Rosen**, and Steve Essinger. "Educational Applications in Digital Image Processing," *Mathematics Teacher*, Aug. 2013.

19. Yemin Lan, Andres Kriete, and **Gail Rosen**. "Selecting Age-related functional characteristics in the human gut microbiome," *Microbiome Journal*, Jan. 2013.

20. Erin Reichenberger, Guillermo Alexander, Marielle Perreault, Jacob A. Russell, Robert J. Schwartzman, Uri Hershberg, and **Gail Rosen**. "Establishing a relationship between bacteria in the human gut and Complex Regional Pain Syndrome," *Brain, Behavior, and Immunity*, Dec. 2012.

21. Xin Chen, Xiaohua Hu, Tze Yee Lim*, Xiajiong Shen, E. K. Park, and **Gail Rosen**. "Exploiting the Functional and Taxonomic Structure of Genomic Data by Probabilistic Topic Modeling," *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, July/August 2012. (**Cover feature**)

22. Karen Sullam, Steven Essinger, Catherine Lozupone, **Gail Rosen**, Susan Kilham, Rob Knight, and Jacob Russell. "Environmental and evolutionary factors that shape gut bacterial communities of fish: a meta-analysis," *Microbial Ecology*, July 2012.

23. **Gail Rosen**, Steve Essinger, and Jason Silverman. "Inquiry-based learning through Image Processing," *IEEE Signal Processing Magazine*, January 2012.

24. **Gail Rosen** and Tze Yee Lim*. "NBC: The Naïve Bayes Classication Tool Update: Viral and Fungal databases," *BMC Research Notes*, January 2012.

25. Yemin Lan, Qiong Wang, Jim Cole and **Gail Rosen**. "Using the RDP classifier to predict novelty and reduce the search space for finding novel organisms," *PLoS ONE*, March 2012.

26. Elaine Garbarine, Vinay Gadia*, Joseph Depasquale, Robi Polikar, and **Gail Rosen**. "An Information Theoretic Approach to SVM Feature Selection for Genome Classification," *Computational Biology and Chemistry*, June 2011.

27. **Gail Rosen**, Robi Polikar, Diamantino Caseiro, Steve Essinger, and Bahrad Sokhansanj. "Discovering the Unknown: Improving Detection of Novel Species and Genera from Short Reads," *Journal of Biomedicine and Biotechnology*, Jan. 2011.

28. **Gail Rosen**, Erin Reichenberger, and Aaron Rosenfeld*. "NBC: The Naive Bayes Classification Tool Webserver for Taxonomic Classification of Metagenomic reads," *Bioinformatics*, Jan. 2011.

29. Non Yok and **Gail Rosen**. "Combining Gene Prediction Methods to Improve Metagenomic Gene Annotation," *BMC Bioinformatics*, Jan. 2011.

30. **Gail Rosen** and Steve Essinger. "Comparison of Statistical Methods to Classify Environmental Genomic Fragments," *IEEE Transactions on NanoBioScience*, Dec. 2010.

31. Jason Silverman and **Gail Rosen**. "Supporting Students Interest in Mathematics through Applications from Digital Image Processing," *Journal of the Research Center for Educational Technology*, Nov. 2010.

32. **Gail Rosen**, Bahrad Sokhansanj, Robi Polikar, Jacob Russell, Elaine Garbarine, Steve Essinger, and Non Yok. "Signal Processing for Metagenomics: Extracting Information from the Soup," *Current Genomics*, Nov. 2009.

33. **Gail Rosen**, Paul Hasler, and Mark T. Smith. "Modified Hebbian Learning Implementation for Localizing and Tracking Diffusive Sources," *Biosystems*, Feb. 2009.

34. **Gail Rosen**, Elaine Garbarine, Diamantino Caseiro, Robi Polikar, and Bahrad Sokhansanj. "Metagenome fragment classification using N-mer frequency profiles," *Advances in Bioinformatics*, Nov. 2008.

35. **Gail Rosen**. "Examining Coding Structure and Redundancy in DNA," *IEEE Engineering in Medicine and Biology Magazine*, Volume 25, Issue 1, January/February 2006.

0.5.2   Patent: 1

1. (Pending) "Multi-temporal Information Object Disambiguation, Classification, and Categorization Software System." Inventors: Zhengqiao Zhao, Gail Rosen, and Jason Rollins. U.S. Patent Application No. 62/465,919 filed March 2, 2017, Non-provisional update: April 2018.

0.5.3   Refereed Conference Publications: 37

1. Z Zhao, J Rollins, L Bai, **G Rosen**. "Incremental Author Name Disambiguation for Scientific Citation Data," *IEEE Intl. Conf. on Data Science and Advanced Analytics (DSAA)*, Oct. 2017. **(26% acceptance rate)**

2. E. Reichenberger, G.L. Rosen, U. Hershberg, and R. Hershberg. "Prokaryotes, Metagenomics, and GC-Content," *IARIA Seventh International Conference on Bioinformatics, Biocomputational Systems and Biotechnologies*, 2015.

3. Greg Ditzler, Matthew Austen*, **Gail Rosen**, and Robi Polikar. "Scaling a neyman-pearson subset selection approach via heuristics for mining massive data," *IEEE Symp. on Computational Intelligence and Data Mining (CIDM)*, Dec. 2014.

4. Greg Ditzler and **Gail Rosen**. " Feature subset selection for inferring relative importance of taxonomy," *Proc. of the 5th ACM Conf. on Bioinformatics, Comp. Biology, and Health Informatics*, Sept. 2014.

5. Greg Ditzler, **Gail Rosen**, and Robi Polikar. "Domain adaptation bounds for multiple expert systems under concept drift," *IEEE Intl. Joint Conference on Neural Networks*, July 2014. **(Best Student Paper Award)**

6. Greg Ditzler, **Gail Rosen**, and Robi Polikar, "Incremental learning of new classes from unbalanced data," *IEEE International Joint Conference on Neural Networks*, June 2013.

7. Gregory Ditzler, **Gail Rosen**, and Robi Polikar. "Discounted expert weighting for concept drift," *IEEE Symp. on Computational Intelligence in Dynamic and Uncertain Environments (CIDUE)*, April, 2013.

8. Gregory Ditzler, **Gail Rosen**, and Robi Polikar. "Information theoretic feature selection for high dimensional metagenomic data," *IEEE Genomic Signal Processing and Statistics (GENSIPS)*, December 2012.

9. Gregory Ditzler, **Gail Rosen**, and Robi Polikar. "Transductive learning algorithms for nonstationary environments," *IEEE International Joint Conference on Neural Networks*, June 2012.

10. Gregory Ditzler, Robi Polikar, and **Gail Rosen**. "Determining significance in metagenomic samples," *38th Annual Bioengineering Conference (NEBEC)*, March 2012.

11. Gregory Ditzler, Robi Polikar, and **Gail Rosen**. "Forensic Identification with Environmental Samples," *IEEE Intl. Conference on Acoustics, Speech, and Signal Processing*, March 2012.

12. Steve Essinger, Robi Polikar, and **Gail Rosen**. "Ordering Samples along Environmental Gradients using Particle Swarm Optimization," *IEEE Engineering in Medicine and Biology Conference*, September 2011.

13. Steve Essinger and **Gail Rosen**. "An Introduction to Machine Learning for Students in Secondary Education," *IEEE Signal Processing in Education Workshop*, January, 2011. (**Best Student Paper Award**)

14. Xin Chen, Xiaohua Hu, Xiajiong Shen, and **Gail Rosen**. "Probabilistic Topic Modeling for Genomic Data Interpretation," *IEEE Intl. Conference on Bioinformatics and Biomedicine*, Hong Kong, December 2010. (**17% acceptance rate**)

15. Xin Chen, Xiaohua Hu, Zhongna Zhou, Caimei Lu, **Gail Rosen**, Tingting He, and E. K. Park. "A Probabilistic Topic-Connection Model for Automatic Image Annotation," *19th ACM International Conference on Information and Knowledge Management*, Toronto, Ontario, October 2010.

16. Non Yok and **Gail Rosen**. "Benchmarking of Gene Prediction Programs for Metagenomic Data," *IEEE Engineering in Medicine and Biology*, Buenos Aires, Argentina, September 2010.

17. Steve Essinger, Robi Polikar, and **Gail Rosen**. "Neural Network-based Taxonomic Classification for Metagenomics ," *IEEE International World Congress on Computational Intelligence (WCCI)*, Barcelona, Spain, July 2010.

18. Steve Essinger and **Gail Rosen**. "The Effect of Sequence Error and Partial Training Data on BLAST Accuracy of Short Reads," *IEEE Bioinformatics and Bioengineering Conference (BIBE)*, Philadelphia, PA, June 2010.

19. Non Yok and **Gail Rosen**. "Comparison of Gene Prediction Programs for Metagenomic Data," *IEEE Bioinformatics and Bioengineering Conference (BIBE)*, Philadelphia, PA, June 2010.

20. Steve Essinger, Ryan Coote*, Pete Konstantopoulos, Jason Silverman, and **Gail Rosen**. "Reflections and Measures of STEM Teaching and Learning on K-12 Creative And Performing Arts Students," *American Society of Engineering Education (ASEE) Annual Conference*, Louisville, Kentucky, June 2010.

21. Steve Essinger and **Gail Rosen**. "Benchmarking BLAST Accuracy of Genus/Phyla Classification of Metagenomic Reads," *Pacific Symposium on Biocomputing*, Hawaii, Jan. 2010

22. **Gail Rosen**, Jason Silverman, and Adheer Chauhan. "Connecting Artistically-inclined K-12 Students to Physics and Math through Image Processing Examples," *IEEE DSP in Education Workshop*, Marco Island, FL, Jan. 2009.

23. Non Yok and **Gail Rosen**. "An Iterative Approach to Probe-Design for Compressive Sensing Microarrays," *IEEE Workshop on Systems Biology and Medicine*, Philadelphia, PA, Nov. 2008. (**32% acceptance rate**)

24. Vinay Gadia* and **Gail Rosen**. "A Text-Mining Approach for Classification of Genomic Fragments," *IEEE International Workshop on Biomedical and Health Informatics*, Philadelphia, PA, Nov. 2008.

25. Zhiyu Wang, David Casale, **Gail Rosen**, and MinJun Kim. "Tracking Bacteria in a microfluidic chemotaxis assay," *ASME International Mechanical Engineering Congress and Exposition*, Boston, Massachusetts, Nov. 2008

26. Zhiyu Wang, MinJun Kim, and **Gail Rosen**. "Validating Models of Chemotaxis by Simulating the Random Motility Coefficient," *IEEE BioInformatics and BioEngineering Conference*, Athens, Greece, Oct. 2008.

27. Elaine Garbarine and **Gail Rosen**. "An Information Theoretic Method of Microarray Probe Design for Genome Classification," *IEEE Engineering in Medicine and Biology Society Conference*, Vancouver, Canada, August 2008.

28. Elaine Garbarine and **Gail Rosen**. "The Effects of C-G Content and Mutations in the Fourier Transform Method for Periodicity," *IEEE Genomic Signal Processing and Statistics Workshop*, Phoenix, AZ, June 2008.

29. **Gail Rosen**. "Comparison of Autoregressive Measures for DNA Sequence Similarity," *IEEE Workshop on Genomic Signal Processing and Statistics (GENSIPS)*, June 2007.

30. **Gail Rosen**. "ULA Delay-and-sum Beamforming for Plume Source Localization," *IEEE Workshop on Signal Processing Applications for Public Security and Forensics*, April 2007.

31. **Gail Rosen** and Paul Hasler. "Chemical source localization in unknown turbulence using the cross-correlation method," *IEEE Intl. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)*, Toulouse, France, May 2006. (**Best Student Paper**)

32. **Gail Rosen**, Marion Usselman, and Donna Llewellyn. "Relating High School Mathematics Through Sound and Images," *ASEE Southeast Section Annual Conference*, Chattanooga, TN, April 2005.

33. Venkatesh Srinivasan, **Gail Rosen**, and Paul Hasler. "Low-Power Realization of FIR Filters Using Current-Mode Analog Design Techniques," 38th *IEEE Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2004.

34. **Gail Rosen**, Mark T. Smith, and Paul Hasler. "Circuit Implementation of a 2-D Gradient Source Localizer," 3rd *IEEE Conference on Sensors*, Vienna, Austria, October 2004. (**2nd in Best Student Paper Competition**)

35. **Gail Rosen** and Paul Hasler. "Biologically-inspired Odor Localization Using Beamforming," 2nd *IEEE Genomic Signal Processing Workshop (GENSIPS)*, Baltimore, MD, May 2004.

36. **Gail Rosen**. "Finding Near-Periodic DNA Regions using a Finite-Field Framework," 2nd *IEEE Genomic Signal Processing Workshop (GENSIPS)*, Baltimore, MD, May 2004.

37. **Gail Rosen** and Jeff Moore. "Investigation of Coding Structure in DNA," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Hong Kong, April 2003.

38. **Gail Rosen** and James D. Johnston. "Automatic Loudspeaker Directivity Control for Soundfield Reconstruction," 19th *Audio Engineering Society International Conference*, Bavaria, Germany, June 2001.

0.5.4 Invited Book Chapters and Thesis: 5

1. Stephen Woloszynek, Steven Pastor, Josh C. Mell, Neil Nandi, Bahrad Sokhansanj, **Gail Rosen**. "Engineering Human Microbiota: Influencing Cellular and Community Dynamics for Therapeutic Applications," *International Review of Cell and Molecular Biology*, 324, 67-124, Dec. 2016.

2. Jean-luc Bouchot, William Trimble, Greg Ditzler, Yemin Lan, Steve Essinger, and **Gail Rosen**. "Advances in Machine Learning for Processing and Comparison of Metagenomic Data," *Computational Systems Biology*, Publisher: Elsevier, Feb. 2014.

3. Greg Ditzler, Yemin Lan, Jean-Luc Bouchot, and **Gail Rosen**. "Variable selection to improve classification of metagenomes," *Encyclopedia of Metagenomics*, Publisher: Springer, Nov. 2013.

4. **Gail Rosen** and Paul Hasler. "Chemotaxis: Learning Navigation and Source Localization Strategies from Biology's Engineered Designs," *Systems Bioinformatics: An Engineering Case-Based Approach.* Artech House: Norwood, MA, Feb. 2007.

5. **Gail Rosen**. Signal processing for biologically-inspired gradient source localization and DNA sequence analysis, *Georgia Institute of Technology*, 2006.

0.5.5 Citations

Total (as of August 2017): 1050
h-index (as of August 2017): 16
For more information, visit my Google Scholar page at:
`http://scholar.google.com/citations?hl=en&user=VORcAKUAAAAJ`.

0.5.6 Refereed-Abstract Biology Conferences (Poster and Presentations)

1. S. Woloszynek, J.C. Mell, G. Simpson, and **G. Rosen**. "Uncovering Thematic Metagenomic Structure Associated with Human Host Features," *Intl. Human Microbiome Congress*, Houston, 2016.

2. Y. Lan, R. Hershberg, and **G. Rosen**. "Fast-evolving marker genes are useful for predicting genome-wide similarity levels between closely related prokaryotic strains," *16th International Symposium on Microbial Ecology*, Montreal, 2016.

3. S. Woloszynek, J.C. Mell, and **G. Rosen**. "Uncovering Metagenomic Topics Associated with Host Metadata," *Bridging Biomedical Worlds,* Hong Kong, 2016.

4. S. Woloszynek, J.C. Mell, and **G. Rosen**. "Uncovering Metagenomic Topics Associated with Host Metadata," *Mid Atlantic Bioinformatics Conference,* UPenn, 2016.

5. S. Woloszynek, L.P. Tabb, and **G. Rosen**. "Overcoming Zero Inflation in Sparse OTU Tables," *DTRA/NSF Workshop: Algorithms for Threat Detection*, NSF, Arlington, VA, 2015.

6. G. Ditzler and **G. Rosen**, "Scalable Subset Selection Using Filters and its Applications," *DTRA/NSF Algorithms Workshop*, Arlington, VA, 2015.

7. Y. Lan and **G. Rosen**. "Potential Microbial Interactions Inferred from complementary and augmented metabolites," *5th International Human Microbiome Congress*, 2015.

8. Y. Lan, J. C. Morrison, R. Hershberg, and **G. L. Rosen**, "POGO-DB: a database of pairwise- comparisons of genomes and conserved orthologous genes," in *15th International Symposium on Microbial Ecology*, Seoul, Korea, 2014. **(Presentation)**

9. Y. Lan, B. Stenuit, **G. L. Rosen**, J. B. Hughes, L. Alvarez-Cohen, and C.M. Sales, "Effects of historical 2,4,6-trinitrotoluene (TNT) contamination and periodic mechanical tillage on soil microbial consortia and remediation activity," in *15th International Symposium on Microbial Ecology*, Seoul, Korea, 2014.

10. Y. Lan, and G.L. Rosen, "Potential microbial interaction inferred from complementary and augmented metabolites," in *15th International Symposium on Microbial Ecology*, Seoul, Korea, 2014.

11. N. Clark, Y. Lan, **G. L. Rosen**, and C. B. Blackwood, "Relating microbial physiological performance to genome content," in *98th ESA Annual Convention*, 2013.

12. Yemin Lan and Gail Rosen. "Selecting age-related features in the human gut microbiome," *Intl. Human Microbiome Congress*, Sept. 2013. **(Presentation – Best Paper Award)**

13. Yemin Lan and Gail Rosen. "POGO-DB: a database of pairwise-comparisons of genomes and conserved orthologous genes," *Intl. Human Microbiome Congress*, Sept. 2013.

14. Greg Ditzler, Yemin Lan, and Gail Rosen. "Functional feature selection over varying phenotypes: Integration of feature selection methods into KBase," *Dept. of Energy Genomic Science Annual Contractor-Grantee meeting*, Feb. 2013. **(Presentation)**

15. Steve Essinger, Gail Rosen, and Chris Blackwood. "Detection of Latent Biotic Covariation Embedded in Environmental Gradient Responses," *Dept. of Energy Genomic Science Annual Contractor-Grantee meeting*, Feb. 2013.

16. Greg Ditzler and Gail Rosen. "Deep learning of feature and structure for soil samples," *DTRA/NSF Algorithms for Threat Detection Workshop*, San Diego, Nov. 2012.

17. Y. Hu, P. Lukasik, Y. Lan, C. S. Moreau, **G. L. Rosen**, and J. A. Russell, ?Variation of symbiotic gut communities across diets and colonies of the ant Cephalotes varians,? in Entomological Society of America Annual Meeting, 2012.

18. Yemin Lan, Nivedita Clark, Chris Blackwood, and Gail Rosen. "Identifying functional signatures in microorganism genomes related to polymer decomposition," *4th Annual Argonne National Labs Soil Metagenomics Workshop*, Chicago, IL, October 3rd, 2012.

19. Steve Essinger, Erin Reichenberger, Chris Blackwood, and Gail Rosen. "An ARB Toolkit for Custom Databases and Massive Phylogenies," *Dept. of Energy Genomic Science Annual Contractor-Grantee meeting*, Feb. 2012.

20. Gail Rosen and Yemin Lan. "Using the RDP classifier to predict novelty," *3rd Annual Argonne National Labs Soil Metagenomics Workshop*, Chicago, IL, October 6, 2011. **(Presentation)**

21. Gail Rosen. "Detecting Novel Taxa from Next-Generation Sequencing Reads," *NIH Human Microbiome Research Conference*, St. Louis, MO, September 1, 2010. **(Presentation)**

22. Tze Yee Lim* and Gail Rosen. "Random Indexing to Reduce Feature Dimensions Used in Taxonomic Classification of Next Generation Reads," *NIH Human Microbiome Research Conference*, St. Louis, MO, September 1, 2010.

23. Steve Essinger, Robi Polikar, and Gail Rosen. "Neural-network Based Taxonomic Clustering for Metagenomics," *Intl. Symposium on Microbial Ecology (ISME)* , Seattle, WA, August 2010.

24. Karen Sullam, Steve Essinger, Gail Rosen, and Jacob Russell. "Environmental and evolutionary factors that shape gut bacterial communities of fish: a meta-analysis," *Intl. Symposium on Microbial Ecology (ISME)*, Seattle, WA, August 2010.

25. Karen Sullam, Steve Essinger, Gail Rosen, and Jacob Russell. "Environmental and evolutionary factors that shape gut bacterial communities of fish: a meta-analysis," *Ecological Society of America Annual Meeting*, Pittsburgh, PA, August 2010.

26. Gail Rosen, Steve Essinger, and Diamantino Caseiro. "Detecting Novel Species and Genera from Short Next-Gen Reads," *Intl. Symposium on Microbial Ecology (ISME)*, Seattle, WA, August 2010.

27. Gail Rosen, Steve Essinger, and Diamantino Caseiro. "Detecting Novel Species and Genera from Short Next-Gen Reads," *Metagenomics, Metadata and Metaanalysis (M3) and Biosharing Workshop*, Boston, MA, July 2010. **(Presentation)**

28. Gail Rosen. "The Challenges of Taxonomy in Soil Metagenomics," *Agronomy, Crops, and Soils Conference*, Pittsburgh, PA, Nov. 2009. **(Presentation)**

29. Gail Rosen. "Signal Processing for Metagenome Taxonomic Classification," *Association of Biomolecular Research Facilities (ABRF) Conference*, Memphis, TN, Feb. 2009. **(Presentation)**

30. Gail Rosen and Bahrad Sokhansanj. "Comparison of a Naive Bayes Classifier to BLAST for Identification of Sequence Reads," *Metagenomics Conference*, San Diego, Nov. 2008.

0.6 Invited Presentations: 30

1. "Computational Challenges in Processing Metagenomic Data," ACM BCB Workshop on Microbiomics, 2017.

2. "Computational Challenges in Processing Metagenomic Data," Rutgers University, April 2017.

3. "Continual Learning Systems for a Data Intensive World," DataBytes Natl. Consortium on Data Science, Feb. 2017.

4. "Deep Thought: How Machine Learning is Changing Our World," Philadelphia Science Festival, April 2016.

5. "A Review of Denoising for Nanopore Methods," Weill Cornell Medicine, March 2016.

6. "Computational Challenges in Processing Metagenomic Data," Fundação Oswaldo Cruz Foundation (Fiocruz), Feb. 2016.

7. "Computational Challenges in Processing Metagenomic Data," Lawrence Livermore National Laboratory, May 2015.

8. "Computational Challenges in Processing Metagenomic Data," Oregon State University, April 2014. (**Plenary Talk)**

9. "Deciphering the Hidden Majority: Analyzing the microbiome through computational metagenomics," University of Pennsylvania EcoLunch, 2013.

10. "Deciphering the Hidden Majority: Analyzing the microbiome through computational metagenomics," Drexel College of Medicine, 2013.

11. "Microbiome Informatics: Deciphering microscopic life and its interactions in the body and the world," Rowan University, 2013.

12. "Using Functional Profiles to Classify and Identify Features in Microbiome Data," NYU School of Medicine, 2012.

13. "Using Functional Profiles to Classify and Identify Features in Microbiome Data," Bertinoro Workshop on Computational Biology, 2012.

14. "Microbiome Informatics: Deciphering microscopic life and its interactions in the body and the world," New Jersey Institute of Technology Computer Science Seminar, 2012.

15. "Microbiome Informatics: Deciphering microscopic life and its interactions in the body and the world," Lehigh University, 2012.

16. "Using the RDP classifier to predict taxonomic novelty in soil," 3rd Argonne National Laboratory Conference on Soil Metagenomics, Chicago, IL, 2011.

17. "Taxonomic Analysis for Marine Metagenomics," US-EC Workshop on Marine Genomics: Next Generation Scientists for Next-Generation Sequencing, Washington, DC, 2010.

18. "Signal Processing Methods for Metagenomic Analysis," University of Delaware SPCC Seminar, 2010.

19. "Detecting Novel Species and Genera in Metagenomic Reads," NIH Human Microbiome Conference, St. Louis, MO, 2010.

20. "Detecting Novel Species and Genera in Metagenomic Reads," M3 Biosharing Workshop, Boston, MA, 2010.

21. "The Challenges of Taxonomy in Soil Metagenomics," Agronomy, Crops, and Soils Conference, Pittsburgh, PA, 2009.

22. "Machine Learning for Short-read Binning and Prediction of Novel Genomes," Allegheny General Hospital, Center for Genomic Sciences, Pittsburgh, PA, 2009.

23. "Signal Processing for Metagenome Taxonomic Classification," Association of Biomolecular Research Facilities, Memphis, TN, February, 2009.

24. "The Challenges of Taxonomic Classification in Metagenomics," J. Craig Venter Institute, Rockville, MD, November 13th, 2008.

25. "The Challenges of Taxonomic Classification in Metagenomics," Villanova ECE Dept., Philadelphia, PA, October 3rd, 2008.

26. "The BioChem Signal Processing Group Overview" Lockheed Martin, Cherry Hill, NJ, May 2nd, 2008.

27. "Overview of the Biochem Signal Processing Lab at Drexel University," The Nanotechnology Institute of Ben Franklin Technology Partners, Philadelphia, PA March 20th, 2008.

28. "Understanding Chemotaxis to Engineer better Chemical Localization Systems," KTH (Royal Institute of Sweden), Stokholm, Sweden June 13th, 2007.

29. "Signal Processing for DNA Analysis and Chemotaxis-Inspired Design," IEEE Philadelphia Seminar, April 17th, 2007.

30. "Signal Processing for DNA Analysis and Chemotaxis-Inspired Design," School of Biomedical Engineering Seminar, Drexel, January 19th, 2007.

31. "Understanding Biological Systems with Signal Processing," University of Maryland, College Park, MD, 2006.

32. "Understanding Bio-complexity with Signal Processing," Technical University of Lisbon, Portugal, 2006.

33. "Understanding Biological Systems with Signal Processing," University of British Columbia, Canada, 2006.

34. "Understanding Bio-complexity with Signal Processing," University of Vermont, 2006.

0.7 Awards and Recognition (including group members, not including paper or grant awards above)

2017	**Selected to attend the NSF/NIH Data Science Innovation Lab on Challenges in our Understanding of the Microbiome in Boston**
2016	**Selected to attend the NSF/NIH Data Science Innovation Lab at Lake Arrowhead**

2009-2014	**Gail Rosen receives National Science Foundation CAREER Award**
2011-2012	**Gail Rosen receives Drexel University's Faculty Career Development Award**
2006	Gail Rosen receives Best Student Paper in ITT division at IEEE Intl. Conf. on Acoustics, Speech, and Signal Processing (ICASSP)
2005	Gail Rosen receives Georgia Tech Outstanding Research Paper from the SAIC Corporation
2005	Gail Rosen receives Society of Women Engineer's Scholarship (sponsored by Cisco)
2004	Gail Rosen is awarded 2nd in Best Student Paper Competition at the Intl. IEEE Sensors Conference
2000-2006	Gail Rosen is awarded AT&T Research Laboratories Grant recipient
2000-2005	Gail Rosen is awarded NSF Graduate Research Fellowship
2003-2004	Gail Rosen receives NSF GK-12 Teaching Fellowship
2003	Gail Rosen receives Georgia Tech ECE Outstanding Teaching Award
2003	Gail Rosen receives Fellowship to IEEE/NSF Biocomplexity Summer School
1998	Gail Rosen receives Women in Electronics Scholarship (Atlanta Org for Women in Electronics)
1994	Gail Rosen is selected for the Department of Energy Sandia National Labs Summer Program
1993	Gail Rosen is selected for the NASA Kennedy Space Center Summer High School Intern Program
1992	Gail Rosen is selected for the University of Florida Science & Tech High School Program

0.8 Students Supervised

0.8.1 Postdoctoral Trainees

Trainee	Years Advised	New Position
Jean-luc Bouchot	2013-2014	Postdoc at RWTH Aachen University
David Koslicki	2012-2013	Assistant Prof. in Math at Oregon State University

0.8.2 Ph.D. Students

Student	Dept.	Start Date	Candidacy	Proposal	Defense	New Position
Chad Cullen	Biomed	June 2017				
Zhengqiao Zhao	ECE	September 2016	September 2017			
Steve Woloszynek	ECE	September 2014	September 2015	November 2017	June 2018	Drexel Medical School Resident
Greg Ditzler	ECE	September 2011	March 2012	April 2014	April 2015	Assistant Prof. in ECE at Univ. of Arizona
Erin Reichenberger	Biomed	September 2011	December 2011	September 2014	April 2015	Postdoc at USDA
Yemin Lan	Biomed	September 2010	November 2011	April 2013	July 2015	Bioinformatician at UPenn Medicine
Steven Essinger	ECE	September 2008	April 2010	December 2011	December 2013	Research Scientist at Pandora Inc.
Non Yok	ECE	January 2008	September 2008	February 2010	May 2011	Instructor at U. Nebraska, Omaha

0.8.3 ECE Masters Students

Student	Graduation Date	New Position
Dhantha Gunarathna	June 2017	TBA
Elaine Garbarine	June 2009	Lockheed Martin
Adheer Chauhan	June 2008	Barclays

0.8.4 Undergraduate Researchers

Ken O'Driscoll	ECE	June 2007-September 2008
Vinay Gadia	ECE	January 2008-June 2009
Ryan Coote	ECE	April 2008-June 2009
Chidi Ike-Egbuono	ECE	April 2008-June 2009
Tze Yee Lim	Physics	April 2010-June 2011
Max Haley	CS	April 2011-August 2011
Jacob Clouse	Biomed	June 2011-August 2011
Aaron Rosenfeld	CS	June 2010-August 2011
Christine Ho	Biomed	April 2010-2012
Adrian Lorenzana	Math	April 2012-2013
J. Calvin Morrison	CS	2013-2015
Felix Agbavor	Biomed	2017
Alexandru Cristian	CS	2017-Present

0.9 Professional and Service Activities

0.9.1 Professional Society Membership

Date	Organization
1998-Present	Institute of Electrical and Electronics Engineers (IEEE)
2013-Present	Senior Member of IEEE
	Societies:
	Signal Processing Society
	Engineering in Medicine and Biology Society
	Women in IEEE
1998-Present	Society of Women Engineers
2010-2016	Intl. Society of Molecular Ecology

0.9.2 Professional Society Chair and Technical Committees

Date	Position	Description
2007-Present	Chair	IEEE Philadelphia section Signal Processing/ Broadcast Technology/ Communications Engineering
2010-2012	Member	IEEE Signal Processing Society Signal Processing in Education Technical Committee

0.9.3 Journal Editorial Board

2012-Present	BioMed Central Microbiome Journal
2015-2017	Associate Editor of EURASIP Journal on Bioinformatics and Systems Biology
2013-2015	Associate Editor of IEEE Signal Processing Magazine

0.9.4 Conference Activity

Date	Description
2017	ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM BC
2017	Invited Speaker at AMIA Joint Summits Panel on "Tools for Accessible and Reproducible Con in Microbiome Research"
2017	Great Lakes Bioinformatics (GLBIO) Conference Program Committee
2014	2nd ACM Intl. Workshop on Big Data in Life Sciences (BigLS) Program Committee
2014	IEEE Signal Proc. in Med. and Biology Symposium (SPMB) Program Chair
2012	**Organizer and Chair of Drexel Eastern Consortium for Microbiome Research**, `http://www.ece.drexel.edu/gailr/EESI/consortium`
2012	IEEE ICASSP Technical Program Committee
2011	**IEEE SPE (Signal Processing in Education) Workshop Technical Program Chair**
2011	IEEE BIBM Publicity Chair
2010,11,12	IEEE BIBM Technical Program Committee
2010	IEEE BIBE Conference Track chair of DNA Sequence Analysis Session
2009,2010	IEEE GENSIPS Technical Program Committee
2009	Association of Biomolecular Resource Facilities (ABRF) Track Chair of Bioinformatics Session
2008	Engineering Models in Biology Track Chair at IEEE BIBE Conference
2008	IEEE Workshop on Genomics Signal Processing and Statistics (GENSIPS) Technical Program Committee

0.9.5 Significant University Service

- 2015 Founded Drexel's **Center for Biological Discovery from Big Data** `http://biomed.drexel.edu/labs/biodiscovery/`

- 2013-Present Co-founded and have served on governing board of Drexel's **University Research Computing Facility** `http://drexel.edu/research/urcf/`

- Served on over 50 PhD candidacy, proposal, and defense committees

0.10 Teaching Activities

0.10.1 Courses

Term	Class Number	Title	Credits
Fall 2006	ECES 690-502	Genomic Signal Processing I	3
Winter 2007	ECES 302A	Transform Methods and Filtering	4
Spring 2007	ECES 302A	Transform Methods and Filtering	4
Fall 2007	ECES 302A	Transform Methods and Filtering	4
Winter 2008	ECES 690-501	Genomic Signal Processing I	3
Spring 2008	ECES 690-501	Genomic Signal Processing II	3
Fall 2008	ENGR 101-104	Freshman Engineering Design Laboratory I	2
Winter 2009	ECES-435	Statistical Signal Processing	4
Winter 2009	ENGR 102-104	Freshman Engineering Design Laboratory II	2
Spring 2009	ECE S690-503	Genomic Signal Processing I	4
Spring 2009	ENGR 103-104	Freshman Engineering Design Laboratory III	2
Winter 2010	ECE S490/S690-001	Genomic Signal Processing I	3
Spring 2010	ECES 302-001/002	Transform Methods and Filtering	4
Spring 2010	ECEC 200 004/05H	Digital Logic Design	4
Fall 2010	ECE S490/S640-001	Genomic Signal Processing	3
Fall 2010	ENGR231-69/70	Linear Engineering Systems	3
Winter 2011	ECES 352	Introduction to Digital Signal Processing	4
Winter 2011	ECE S232-70	Dynamic Engineering Systems	3
Spring 2011	ECES 302	Transform Methods and Filtering	4
Fall 2011	ECES-640	Genomic Signal Processing	3
Fall 2011	ENGR-231-61/62	Linear Engineering Systems	4
Winter 2012	ECES-435	Applications of Digital Signal Processing	4
Winter 2012	ENGR-232-69	Dynamic Engineering Systems	2
Spring 2012	ECES-302	Transform Methods and Filtering	4
Spring 2012	ENGR-231-62/69	Linear Engineering Systems	4
Fall 2012	ENGR-231	Linear Engineering Systems	3
Fall 2012	ENGR 101	Freshman Engineering Design Laboratory I	2
Winter 2013	ECES-352	Introduction to Digital Signal Processing	4
Winter 2013	ENGR 102	Freshman Engineering Design Laboratory II	2
Spring 2013	ENGR-231	Linear Systems	4
Spring 2013	ENGR 103	Freshman Engineering Design Laboratory III	2
Winter 2014	ECES640/490	Genomic Signal Processing	3
Winter 2014	ECE361	Probability and Statistics	3
Fall 2014	ECES631	Deterministic Signal Processing	3
Fall 2014	ECES 490/690	Bioinformatics	3
Spring 2015	ECES 490/690	Statistical Analysis of Genomics	3
Spring 2015	ECEL301	ECE Laboratory I	2
Fall 2016	ECES434	Applied Signal Processing	4
Fall 2016	ECES441/640	Bioinformatics	3
Winter 2017	ECES441/640	Statistical Analysis of Genomics	3
Spring 2017	ECES436	Multidisciplinary DSP	4
Fall 2017	ECES301	Transform Methods and Filtering	4
Fall 2017	ECES434	Multi-disciplinary Signal Processing	4
Winter 2018	ECES301	Transform Methods and Filtering	4
Spring 2018	ECES301	Transform Methods and Filtering	4