NSF BIOGRAPHICAL SKETCH

NAME: Rosen, Gail

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POSITION TITLE & INSTITUTION: Professor, Drexel University

(a) PROFESSIONAL PREPARATION

INSTITUTION	LOCATION	MAJOR / AREA OF STUDY	DEGREE (if applicable)	YEAR YYYY
Georgia Institute of Technology	Atlanta, GA	Electrical Engineering	BS	1999
Georgia Institute of Technology	Atlanta, GA	Electrical and Computer Engineering	MS	2002
Georgia Institute of Technology	Atlanta, GA	Electrical and Computer Engineering	PHD	2006

(b) APPOINTMENTS

2020 - present Professor, Drexel University, Electrical and Comp. Engineering, Philadelphia, PA
2015 - 2016 Visiting Scholar, Weill Cornell Medicine, New York, NY
2013 - 2020 Associate Professor, Drexel University, Philadelphia, PA
2006 - 2013 Assistant Professor, Drexel University, Philadelphia, PA
2004 - 2004 Summer Research Intern, MIT Lincoln Labs, Boston, MA
2000 - 2000 Summer Research Intern, AT&T Research Laboratories, Florham Park, NJ
1997 - 1998 Associate Electrical Engineer, Scientific-Atlanta Inc., Atlanta, GA

(c) PRODUCTS

Products Most Closely Related to the Proposed Project

1. Keshani-Langroodi S. Uncovering the Structure and Function of Microbial Communities Formed During Periodic Tilling of TNT and DNT Co-Contaminated Soils. Biorxiv [Preprint]. 2020 December 14. Available from: https://www.biorxiv.org/content/10.1101/2020.12.12.420737v1
2. Woloszynek S, Mell JC, Zhao Z, Simpson G, O'Connor MP, Rosen GL. Exploring thematic structure and predicted functionality of 16S rRNA amplicon data. PLoS One. 2019;14(12):e0219235. PubMed Central PMCID: PMC6905537.
3. Zhao Z, Rosen G. Visualizing and Annotating Protein Sequences using A Deep Neural Network,. 54th Asilomar Conference on Signals, Systems, and Computers; 2020 November 01; Asilomar, CA. Available from: https://doi.org/10.1109/IEEECONF51394.2020.9443364
4. Cullen CM, Aneja KK, Beyhan S, Cho CE, Woloszynek S, Convertino M, McCoy SJ, Zhang Y, Anderson MZ, Alvarez-Ponce D, Smirnova E, Karstens L, Dorrestein PC, Li H, Sen Gupta A, Cheung K, Powers JG, Zhao Z, Rosen GL. Emerging Priorities for Microbiome Research. Front Microbiol. 2020;11:136. PubMed Central PMCID: PMC7042322.
5. Ching T, Himmelstein D, Beaulieu-Jones B, Kalinin A, Do B, Way G, Ferrero E, Agapow P, Zietz M, Hoffman M, Xie W, Rosen G, ... Greene C. Opportunities and obstacles for deep learning in biology and medicine. Journal of The Royal Society Interface. 2018 April 04;

15(141):20170387-. Available from: https://royalsocietypublishing.org/doi/10.1098/rsif.2017.0387 DOI: 10.1098/rsif.2017.0387

Other Significant Products, Whether or Not Related to the Proposed Project

1. Software from Ecological and Evolutionary Signal-processing and Informatics Lab. Philadelphia, PA: Github; 2021. Available from: http://github.com/EESI
2. McIntyre A, Ounit R, Afshinnekoo E, Prill R, Hénaff E, Alexander N, Minot S, Danko D, Foox J, Ahsanuddin S, Tighe S, Hasan N, Subramanian P, Moffat K, Levy S, Lonardi S, Greenfield N, Colwell R, Rosen G, Mason C. Comprehensive benchmarking and ensemble approaches for metagenomic classifiers. Genome Biology. 2017; 18(1):-. Available from: https://genomebiology.biomedcentral.com/articles/10.1186/s13059-017-1299-7 DOI: 10.1186/s13059-017-1299-7
3. Zhao Z, Cristian A, Rosen G. Keeping up with the genomes: efficient learning of our increasing knowledge of the tree of life. BMC Bioinformatics. 2020 Sep 21;21(1):412. PubMed Central PMCID: PMC7507296.
4. Woloszynek S, Zhao Z, Chen J, Rosen GL. 16S rRNA sequence embeddings: Meaningful numeric feature representations of nucleotide sequences that are convenient for downstream analyses. PLoS Comput Biol. 2019 Feb;15(2):e1006721. PubMed Central PMCID: PMC6407789.
5. Zhao Z, Sokhansanj BA, Malhotra C, Zheng K, Rosen GL. Genetic grouping of SARS-CoV-2 coronavirus sequences using informative subtype markers for pandemic spread visualization. PLoS Comput Biol. 2020 Sep;16(9):e1008269. PubMed Central PMCID: PMC7523987.

(d) SYNERGISTIC ACTIVITIES

1. August 2020-March 2021 -- REU: training an undergraduate black, female student in metagenomics research So far, Melissa Gray, has contributed a software package that assesses how well metagenomic classifiers perform on different taxa, available at https://github.com/EESI/TEA . Now, she is running metagenomic tools for time benchmarks for our new NSF project.
2. Summers of 2017, 2018 -- Intro to DNA, Microbiome, and Data Science Workshop Ran three workshops for the Girls Inc. of PA/NJ Summer Camp for middle school students https://twitter.com/gail_l_rosen/status/1017531795171168257 https://twitter.com/gail_l_rosen/status/1017883737458126848
3. Summer of 2018: Research Experience for Teachers: Hosted 8th grade science teacher, Dr. Kawalpreet Aneja, who is a trained microbiologist, and had her train to develop bioinformatics skills and a class module. She also assisted in writing a microbiome review paper: Cullen et al., "Emerging Priorities for Microbiome Research," Frontiers in Microbiology, 2020.
4. 2007-2012: NSF DK-12 Program (#0733284), http://dk12.ece.drexel.edu Implemented Bioinformatics laboratories in the K-12 classroom at the Creative and Performing Arts High School of Philadelphia and the Philadelphia High School for Girls
5. Organizing Drexel's inaugural Biological Data Science workshop. July 2021: Online workshop that will have 8 sessions 2-4 hours in length that contain topics that include intros to unix, biopython, distributed computing, cloud computing, workflows, machine learning, and

implementation of machine learning. The workshop is geared towards training biologists and genomicists in data science and machine learning.
https://forms.office.com/Pages/ResponsePage.aspx?id=-uZkNr1HpkWWcIxPCA-MpnJaMYI8YutKqUpfsUbAVexUMEhIS1hQVU1DNlM2RDdSUENENlRVMUdFVC4u