# ELHAM AZIZI

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## POSITIONS

**Columbia University**, New York, NY                                               Jan 2020 - Present
*Herbert & Florence Irving Assistant Professor of Cancer Data Research*, Irving Institute for Cancer Dynamics
*Assistant Professor*, Department of Biomedical Engineering
*Affiliated Faculty*, Department of Computer Science
*Affiliated Member*, Data Science Institute
*Member*, Herbert Irving Comprehensive Cancer Center

**Memorial Sloan Kettering Cancer Center**, New York, NY                              2016 - 2019
*Postdoctoral Research Fellow*, Computational & Systems Biology, Mentor : Dana Pe'er

**Columbia University**, New York, NY                                               2014 - 2016
*Postdoctoral Research Scientist*, Biological Sciences, Mentor : Dana Pe'er

**Microsoft Research**, Redmond, WA                                               Summer 2014
*Research Intern*, Supervisor : Bill Bolosky

**Harvard University**, Cambridge, MA                                               2013-2014
*Visiting Researcher*, Department of Statistics, Mentor : Edoardo Airoldi

**Boston University**, Boston, MA                                               2010-2014
*Research Assistant*, Biomedical Engineering Department, Mentor : James Galagan

## EDUCATION

**Boston University**, Boston, MA                                               2010 - 2014
*PhD*, Bioinformatics
Thesis : Modeling Gene Regulatory Networks through Data Integration

**Boston University**, Boston, MA                                               2009 - 2010
*MS*, Electrical Engineering (Machine Learning and Signal Processing)

**Sharif University of Technology**, Tehran, Iran                                   2004 - 2008
*BS*, Electrical Engineering (Signal Processing), minor in Industrial Engineering

## AWARDS & HONORS

Irving Endowed Professorship in Cancer Data Research, Columbia University, 2020.

Tri-Institutional Breakout Prize for Junior Investigators, 2019.

NIH NCI Pathway to Independence Award (K99/R00), 2018.

Finalist, Burroughs Wellcome Fund Career Awards at the Scientific Interface, 2018.

American Cancer Society Postdoctoral Fellowship, 2017.

IBM Best Student Paper Award, New England Statistics Symposium (NESS), 2014.

TEDMED Front Line Scholarship, 2014.

Best Poster Presentation Awards : 10th Annual Machine Learning Symposium, The New York Academy of Sciences, 2016 ; Memorial Sloan Kettering Postdoctoral Research Symposium, 2016 ; Boston Bacterial Meeting, Harvard University, 2013 ; Bioinformatics Student Symposium, Boston University, 2013.

Travel Awards : Ford Fund Travel Award, Drawing Causal Inference from Big Data, National Academy of Sciences, 2015 ; Women In Machine Learning Workshop, 2013 ; Virginia Bioinformatics Institute, Virginia Tech, 2013 ; Intl Society of Computational Biology (ISCB), 2012 ; Bioinformatics Program, Boston University, 2012.

Prize in 11th Intl. Competition of First Step to Nobel Prize in Physics, Polish Academy of Sciences, 2003.

Silver Medal, 16th National Physics Olympiad, Iran, 2003.

## PUBLICATIONS & PREPRINTS

"∗" denotes equal contribution

Bachireddy P*, Azizi E*, Burdziak C, Nguyen VN, Ennis C, Choo Z-N, Li S, Livak K, Neuberg DS, Soiffer RJ, Ritz J, Alyea E, Pe'er D, Wu CJ. , "Mapping the evolution of T cell states during response and resistance to adoptive cellular therapy", **submitted** (AACR abstract).

Price JC, Azizi E, Naiche LA , Parvani JG , Shukla P, Kim S, Slack-Davis JK, Pe'er D, Kitajewski JK, "Notch3 signaling promotes tumor cell adhesion and progression in a murine epithelial ovarian cancer model", **Plos one**, 15(6) : e0233962, 2020.

Burdziak C*, Azizi E*, Prabhakaran S, Pe'er D. , "A Nonparametric Multi-view Model for Estimating Cell Type-Specific Gene Regulatory Networks", **arXiv preprint**, 2019.

Hemmers S, Schizas M, Azizi E, Dikiy S, Zhong Y, Feng Y, Altan-Bonnet G, Rudensky AY, "IL-2 production by self-reactive CD4 thymocytes scales generation of regulatory T cells", **Journal of Experimental Medicine**, 2019.

Viny AD, Bowman RL, Liu Y, Lavallee VP, Eisman SE, Xiao W, Durham BH, Navitski A, Park J, Braunstein S, Alija B, Karzai A, Csete IS, Witkin M, Azizi E, Baslan T, Ott CJ, Pe'er D, Dekker J, Koche R, Levine RL, "Cohesin Members Stag1 and Stag2 Display Distinct Roles in Chromatin Accessibility and Topological Control of HSC Self-Renewal and Differentiation", **Cell Stem Cell**, 25 (5), 682-696. e8, 2019.

Diallo AB , Nguifo EM, Dhifli W, Azizi E, Prabhakaran S, Tansey W, Selected Papers from the Workshop on Computational Biology: Joint with the International Joint Conference on Artificial Intelligence and the International Conference on Machine Learning, 2018, **Journal of Computational Biology** 26(6) : 507-508, 2019.

Azizi E*, Carr AJ*, Plitas G*, Cornish AE*, Konopacki C, Prabhakaran S, Nainys J, Wu K, Kiseliovas V, Setty M, Choi K, Fromme, R.M., Dao P, McKenney P.T., Wasti, R.C., Kadaveru, K., Mazutis L, Rudensky AY, Pe'er D, "Single-cell Map of Diverse Immune Phenotypes in the Breast Tumor Microenvironment", **Cell**, 174 (5) : 1293-1308, 2018 (featured as cover story).

Azizi E*, Prabhakaran S*, Carr A, Pe'er D, "Bayesian Inference for Single-cell Clustering and Imputing", **Genomics and Computational Biology**. 3 (1), 46, 2017.

Prabhakaran S*, Azizi E*, Carr A, Pe'er D., "Dirichlet Process Mixture Model for Correcting Technical Variation in Single-Cell Gene Expression Data", **Proceedings of The 33rd International Conference on Machine Learning (ICML), PMLR.** 48, 1070-1079, 2016 (Acceptance rate : 24%)(Recipient of Dataminr Poster Presentation Award, NYAS Machine Learning Symposium 2016).

Dekhang R, Wu C, Smith KM, Lamb TM, Peterson M, Bredeweg EL, Ibarra O, Emerson JM, Karunarathna N, Lyubetskaya A, Azizi E, Hurley JM, Dunlap JC, Galagan JE, Freitag M, Sachs MS, Bell-Pedersen D, "The Neurospora Transcription Factor ADV-1 Transduces Light Signals and Temporal Information to Control Rhythmic Expression of Genes Involved in Cell-Fusion", **G3 : Genes/ Genomes/ Genetics** 7.1 : 129-142, 2017.

Azizi E, Airoldi EM, Galagan JE, "Learning Modular Structures from Network Data and Node Variables", **Proceedings of the 31st International Conference on Machine Learning (ICML), PMLR**. 32, 1440-1448, 2014 (Acceptance rate : 22%) (Recipient of IBM Best Student Paper Award, NESS 2014).

Gomes AL, Abeel T, Peterson M, Azizi E, Lyubetskaya A, Carvalho L, Galagan JE, "Decoding ChIP-Seq peaks with a double-binding signal refines binding peaks to single-nucleotide and predicts cooperative interaction", **Genome Research**, 2014 : gr. 161711.113.

Azizi E, "Modeling gene regulatory networks through data integration", Ph.D. Thesis, Boston University, 2014.

Galagan JE, Minch K*, Peterson M*, Lyubetskaya A*, Azizi E*, Sweet L*, Gomes A*, Rustad T, Dolganov G, Glotova I, Abeel T, Mahwinney C, Kennedy AD, Allard R, Brabant W, Krueger A, Jaini S, Honda B, Yu WH, Hickey MJ, Zucker J, Garay C, Weiner B, Sisk P, Stolte C, Winkler JK, Van de Peer Y, Iazzetti P, Camacho D, Dreyfuss J, Liu Y, Dorhoi A, Mollenkopf HJ, Drogaris P, Lamontagne J, Zhou Y, Piquenot J, Park ST, Raman S, Kaufmann SH, Mohney RP, Chelsky D, Moody DB, Sherman DR, Schoolnik GK "The Mycobacterium tuberculosis regulatory network and hypoxia", **Nature**. 2013 Jul 11 ; 499 (7457) : 178-183.

Azizi E, "Joint Learning of Modular Structures from Multiple Data Types, **NeurIPS 2013 Workshop** of Frontiers of Network Analysis : Methods, Models, and Applications, Lake Tahoe, NV.

Kianfar S, Azizi E, Kianfar F, "A Comparison of Two Estimators for Solutions to Greedy Algorithm in Scheduling Depletable Sources", **Proceedings of International Conference on Risk Management & Engineering Management (RMEM 2008)**, pp. 80-85, Toronto, Ontario, Canada.

Azizi E, Mohimani GH , Babaie-Zadeh M, "Adaptive Sparse Source Separation with Application to Speech Signals", *Proceedings of IEEE International Conference on Signal Processing and Communications (ICSPC 2007)*, pp. 640-643, Dubai, UAE.

Kianfar S , Azizi E , Kianfar F , "An Approximation Approach to Numerical Solution of Convex Cost Algorithm in Production Planning', *Proceedings of 5th International Management Conference (IMC 2007)*, Tehran, Iran.

## INVITED TALKS

Cell Growth and Proliferation Gordon Research Conference, Mt. Snow, Vermont, (upcoming) July 2021.

Systems Biology Seminar Series, Boston University, March 2020.

Annual Engineering in Medicine Symposium, Columbia University, February 2020.

Inaugural Irving Institute for Cancer Dynamics seminar, Columbia University, November 2019.

New Investigator Keynote Talk, 12th annual RECOMB/ISCB Conference on Regulatory Systems Genomics, New York, November 2019.

New York Genome Center Computational Cancer Genomics Evening Lecture, May 2019.

Harvard Medical School BWH Center for Data Sciences, Mar 2019.

MIT Biology Department & Broad Institute, Feb 2019.

Columbia University Biomedical Engineering Department, Feb 2019.

Rockefeller University, Feb 2019.

Yale School of Medicine Department of Immunobiology, Feb 2019.

University of Pennsylvania Departments of Cancer Biology and Pathology, Jan 2019.

Symposium of Mathematical Genomics, Columbia University, Jan 2019

NYU School of Medicine Institute for Computational Medicine, Jan 2019.

Next Generation in Biomedicine Symposium, Broad Institute, Nov 2018.

The American Society of Human Genetics (ASHG) Annual Meeting, San Diego, Oct 2018.

Keystone Symposia on Translational Systems Immunology, Snowbird, Jan 2018.

Challenges and Synergies in the Analysis of Large-Scale Population-Based Biomedical Data, Oaxaca, Mexico, Nov 2017.

Bioconductor Conference BioC 2017 : Where Software and Biology Connect, Boston, 2017.

2nd Challenges in Computational Biology : Gene Expression Data Analysis, IMB Mainz, Germany, Dec 2016.

ISMB Special Session on Modeling Infectious Diseases, Long Beach, CA, 2012.

## SERVICES & LEADERSHIP

Initiated and co-organized the Workshop on Computation Biology at the International Conference in Machine Learning (ICML) held in NYC 2016, Sydney 2017, Stockholm 2018, Long Beach 2019, virtual 2020.

Moderator, ASHG Session on Understanding tumor heterogeneity from single cell sequencing of genomes, transcriptomes and epigenome, Oct 2018.

Mentor, 1000 Girls, 1000 Futures Program, Global STEM Alliance of the New York Academy of Sciences, 2016.

Reviewer and Event Coordinator for 1st Annual Women in Science @ Columbia (WISC) Graduate Research Symposium, April 2016.

Chair, Contributed Session on Bayesian Applications in Genetics, NESS 2014.