

Aleksandrina Goeva



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Career Goals

I want to be a researcher and keep moving the field of statistics forward through developing new theoretically grounded methods and interdisciplinary collaborations especially in the area of computational biology. I also want to be a teacher because I deeply care about improving science education and bringing more emphasis to critical thinking using data. Finally, I want to keep the artist in me alive and work at the intersection of creativity and rigorous science in the context of discovering and describing patterns.

Education and Work Experience

- **Postdoctoral Fellow** (*Advisor: Evan Macosko*) (2017 - present) **Broad Institute**
 - **PhD in Mathematics & Statistics** (*Advisors: Henry Lam, Eric Kolaczyk*) (2011 - 2017) **Boston University**
 - **MA in Mathematics & Statistics** (2011-2013) **Boston University**
 - **BS in Applied Mathematics** (2007-2011) **Sofia University**
 - **Programming Skills**
Python, GCP, R
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Research Experience

- **Research Interests**
methods development for single-cell RNA-seq and spatial transcriptomics data, statistical learning theory, improving math and statistics education.
 - **Publications**
 - Saunders A, Macosko EZ, Wysoker A, Goldman M, Krienen FM, de Rivera H, Bien E, Baum M, Bortolin L, Wang S, Goeva A, Nemesh J, Kamitaki N, Brumbaugh S, Kulp D, McCarroll SA. “Molecular Diversity and Specializations among the Cells of the Adult Mouse Brain.” *Cell* 2018.
 - Kramer JM, Helfrich C, Levin M, Hwang IT, Samuel PS, Carrellas A, Schwartz AE, Goeva A, Kolaczyk ED. “Initial evaluation of the effects of an environmental focused problem solving intervention for transition age young people with developmental disabilities: Project TEAM.” *Developmental Medicine & Child Neurology*. 2018.
 - Goeva A, Lam H, Qian H and Zhang B. “Optimization-based calibration of simulation input models.” *accepted in Operations Research*. 2018.
 - Goeva A, and Kolaczyk E. “Comment on Airolidi and Bischof, A regularization scheme on word occurrence rates that improves estimation and interpretation of topical content.” *Journal of the American Statistical Association*. 2017.
 - Goeva A, Lam H, and Zhang B. “Reconstructing input models via simulation optimization.” *Proceedings of the 2014 Winter Simulation Conference*. IEEE Press, 2014.
 - **Preprints**
 - Kunin D, Bloom J M, Goeva A and Seed C. “Loss Landscapes of Regularized Linear Autoencoders.” *arXiv* 2019.
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Awards

- **BroadIgnite** (2018) **Broad Institute**
Early career scientist award.
 - **BU-CIRTL Teaching as Research Fellowship** (2016-17) **Boston University**
 - **Graduate School of Arts and Sciences Excellence in Teaching Award** (2015-16) **Boston University**
 - **Outstanding Teaching Fellow in the Department of Math & Stats** (2015-16) **Boston University**
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Invited Talks, Conference Presentations and Workshop Participation

- **Invited Talks**
 - [Intro to Non-negative matrix factorization, Broad MIA](#) (Nov 2018) Cambridge, MA
- **Conference Talks**
 - [Estimating Network Degree Distributions Under Sampling, Keio Workshop](#) (Aug 2016) Boston, MA
 - [Estimating Network Degree Distributions Under Sampling, JSM](#) (Aug 2016) Chicago, IL
 - [Reconstructing Input Models via Simulation Optimization, INFORMS](#) (Nov 2015) Philadelphia, PA
- **Summer Schools and Workshops**
 - Alan Alda Communication Workshop (December 2018) Cambridge, MA
 - CSHL Single Cell Analyses (November 2017) CSHL, NY
 - [RegML 2016 - Regularization Methods for Machine Learning](#) (June 2016) Genova, Italy

Organizational Activities and Services

- Models, Inference and Algorithms Steering Committee (Fall 2017 - present) Broad Institute
Participate in monthly meeting discussing the direction of the seminar, suggest, invite and host speakers.
- Probability and Statistics Student Seminar (Fall 2016, Spring 2017) Boston University
Gave tutorials and talks, recruited graduate students to speak and organized a weekly meeting.
- Award-Winning Teaching Panel (International Grad Students Orientation) (Aug 2016) Boston University
Shared my teaching experience and gave advice on how to achieve excellence in teaching to the new international teaching fellows.
- The Act of Teaching Workshops (New Teaching Fellow Orientation) (Aug 2016) Boston University
Led university-wide workshops on teaching philosophy, managing challenging students and compassionate attitude towards teaching.
- International PhD Matching Program (Summer 2016) Boston University
Facilitating an easier transition to a new country and a new academic environment and providing guidance on the academic program to a new international PhD student.

Teaching Experience

- **Teaching Instructor**
 - Single-Cell Sequencing Nanocourse (March 2018) Harvard Medical School
 - STAT 106 Modeling the World with Calculus, Probability, and Statistics (Summer 2017) Harvard University
 - The Uncertainty of Daily Decision-making, [Clubes de Ciencia](#) (July 2016) Monterrey, Mexico
 - Probability Bootcamp for MSSP Program (August 2015) Boston University
 - MA581 Probability Theory (Summer 2014, 2015) Boston University
 - MA113 Elementary Stats (Summers 2013, 2012) Boston University
- **Teaching Fellow** Boston University
Prepared and led discussion sections, programming labs, occasionally covered lectures, created and graded midterm and final exams in a variety of math/stats/machine learning undergraduate and masters level courses.
 - MA685 Advanced Topics in Applied Statistical Analysis (Spring 2016)
 - MA882 Statistical Practicum (Spring 2016, Fall 2015, Spring 2015)
 - MA214 Applied Statistics (Spring 2014)
 - MA581 Probability Theory (Fall 2013)
 - MA115 Statistics I, MA116 Statistics II (Spring 2013, Fall 2012)
 - MA123 Calculus I, MA124 Calculus II (Fall 2014, Spring 2012, Fall 2011)

Statistical Consulting

- Co-led projects and mentored masters students at the [MSSP Consulting](#) center on walk-in, limited duration and collaborative statistical projects helping graduate students and faculty members from a variety of departments across campus.
Guided a constructive dialogue with the clients in order for me and my team to gain the necessary background knowledge, then I formulated the clients' goals and questions in clear statistical terms, managed the workflow and progress of the project, guided and supervised students, communicated the results to the clients in an accessible way, and overall gained experience doing interdisciplinary research through working with a wide range of collaborators.

Languages

Bulgarian (native), English (fluent), Spanish (intermediate)